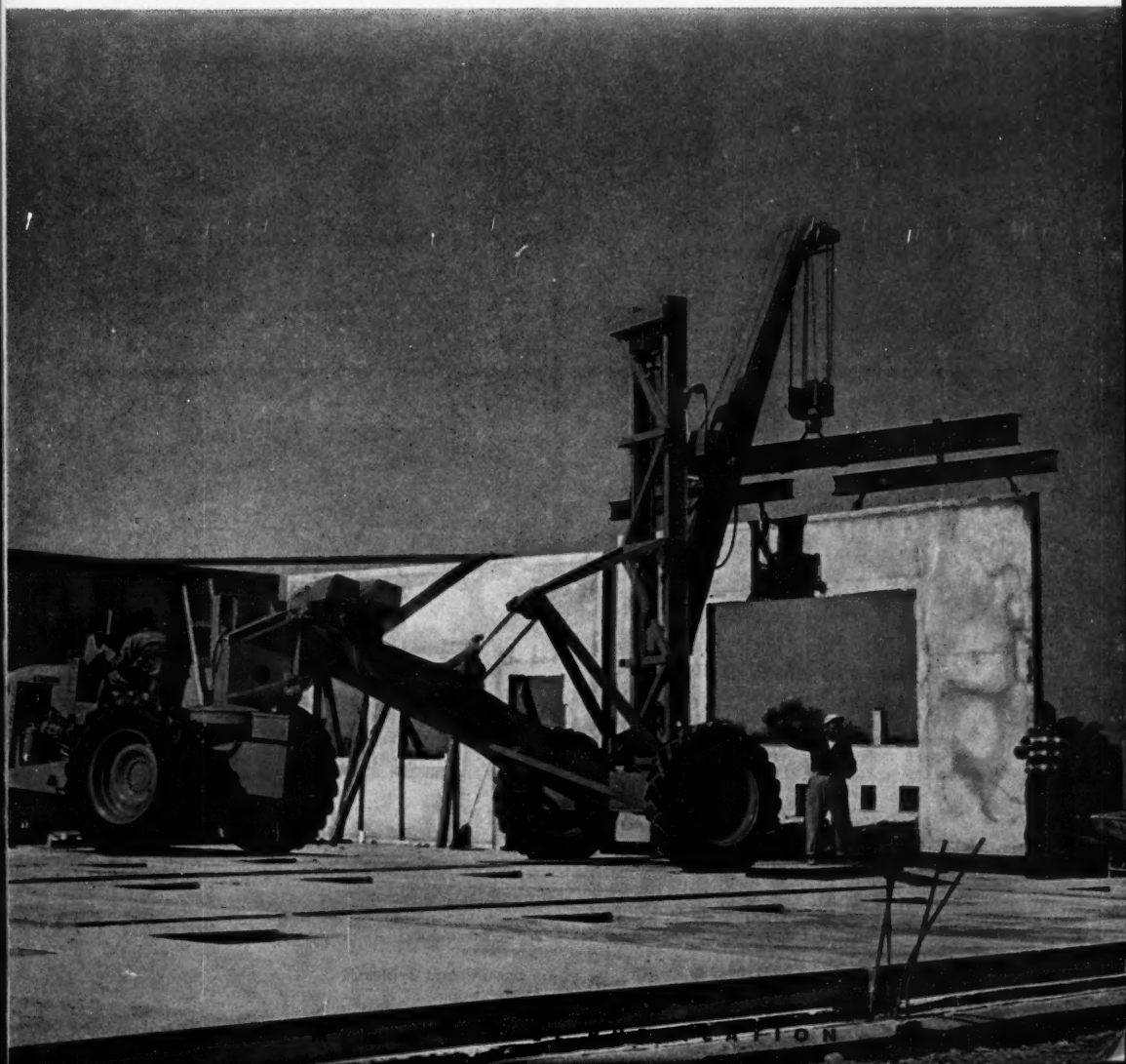


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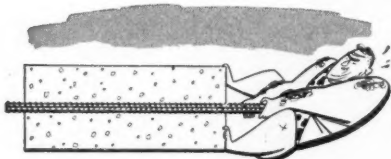
CONSTRUCTION

METHODS AND EQUIPMENT

August 1951

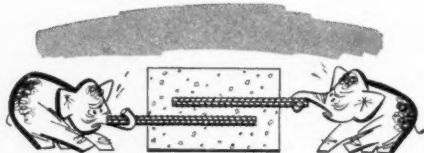


**Advantages offered by
Inland HI-BOND since 1943¹
now officially recognized by
American Concrete Institute**



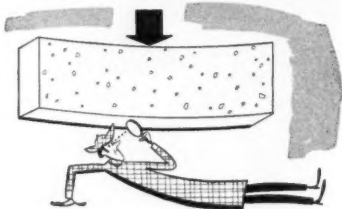
**1 Increased bond stresses and
greater resistance to slip**

See reports on National Bureau of Standards research by Arthur Clark . . . ACI Proceedings, Vol. 43, p. 381; Vol. 44, p. 437; Vol. 46, p. 161; by C. C. Fishburn . . . ACI Proceedings, Vol. 44, p. 289.



**2 Increased efficiency
at splices**

See reports on National Bureau of Standards research by Ralph W. Kulge and E. C. Tuma . . . ACI Proceedings, Vol. 42, p. 13.



**3 Reduced width of
tensile cracks**

See reports on National Bureau of Standards research by David Watstein and Norman Seese, Jr. . . . ACI Proceedings, Vol. 41, p. 293.



**4 Hook anchorages unnecessary
in most applications**

See reports on National Bureau of Standards research by C. C. Fishburn . . . ACI Proceedings, Vol. 44, p. 289; by F. E. Richart . . . ACI Proceedings, Vol. 45, pp. 97 and 237.

See new ACI Building Code

INLAND HI-BOND®

INLAND STEEL COMPANY 38 S. Dearborn St., Chicago 3, Illinois

The reinforcing bar with
the built-in anchorage



B.F. Goodrich



These tires carry 95 tons over crushed limestone—with ease!

HAULING heavy loads over jagged rock in all kinds of weather calls for tires that can really "take it." Yet this is an everyday occurrence for these B. F. Goodrich Rock tires. The BFG's shown here are used on vehicles that haul limestone and shale from quarry to plant. The total load is 190,000 lbs., of which 88,000 lbs. is pay load.

B. F. Goodrich tires can give this kind of service because they are built to stand up under the most hazardous quarry and construction hauling conditions. For added protection, the pat-

ented *nylon shock shield* is built into all B. F. Goodrich tires of 8 or more plies. Extra strong, elastic nylon cords are placed between the tread rubber and the cord body. Under impact, these cords work together, absorbing and distributing the shock evenly. The shock shield protects against bruises and means more recappable tires as well as longer service. Here is a construction advantage which is found only in BFG tires — and at *no additional cost*.

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any off-the-road tires see your BFG dealer. Or write for additional information on these tires that do a better job at lower cost. *The B. F. Goodrich Company, Akron, Ohio.*





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WAY!

● You cut out costly loading "detours" . . . save time and effort . . . with an Oliver Industrial Wheel Tractor and Strait-Line Loader. This revolutionary hydraulic, double end tractor-loader can load either in front or rear . . . dump in front. The operator can load and dump without twisting or turning the tractor . . . travel a *straight line* between pile and truck.

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CONSTRUCTION METHODS AND EQUIPMENT

Volume 33, Number 8

AUGUST 1951

Established 1919

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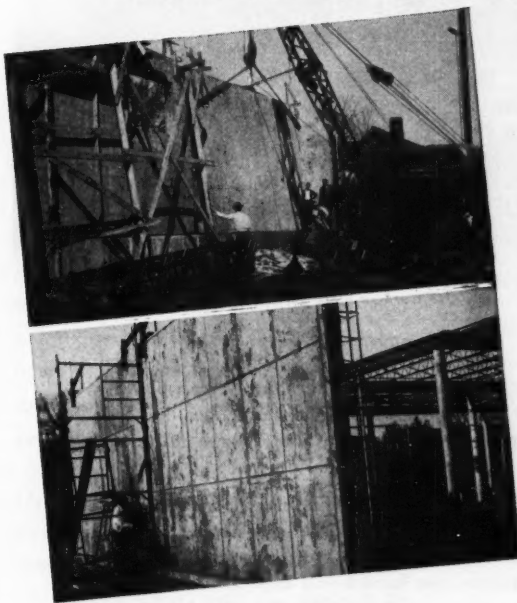
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WHAT MR. SEARS DIDN'T KNOW ABOUT RETAIL STORE BUILDING, MR. ROEBUCK DID!



● Sears-Roebuck expresses astute merchandising in terms of advanced store design and planned construction economies, using quality concrete for lowest initial and annual cost.

New stores, at Florence (shown here) and at Anniston, Alabama, each with 50,000 sq. ft. floor space, exemplify modern construction trends, with completely integrated design, including related parking area.

Exterior wall panels are 'sandwich' design, with inner two inches of vermiculite concrete, using 'INCOR' 24-HOUR CEMENT to speed placing the rest of the 8-in.-thick panel. (With sandwich design, practically any desired heat-transmission value can be obtained.) Grooved panel exteriors add wall interest.

After tilting panels into position, columns were poured between panels, then beam and parapet cast, completing the walls. Heavy cardboard tubing was used for forming the 15-ft., 12-in.-diameter, cast-in-place interior concrete columns.

Example of *selective concreting*—using Lone Star Cement for quality concrete and switching to 'Incor', where America's FIRST high early strength Portland cement saves time—and time is costlier than ever these days!

*Reg. U. S. Pat. Off.

SEARS, ROEBUCK & CO.
Retail Store Buildings: Florence and Anniston, Alabama
Architect: F. E. DAVIDSON, Atlanta

Contractor, Florence Store:
DANIEL CONSTRUCTION CO., INC., OF ALABAMA
Birmingham

Contractor, Anniston Store:
FRANK H. BROWNETTE, Jacksonville, Fla.

Lone Star and 'Incor' Ready-Mix Concrete:
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JOHN B. LAGARDE, INC., Anniston



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**RIGHT UP
ON THE
SIDEWALK**
smack against the
STORE FRONTS



The job occurred in the heart of downtown Syracuse at one of the busiest intersections. Gradall's ability to work in close quarters avoided traffic troubles.

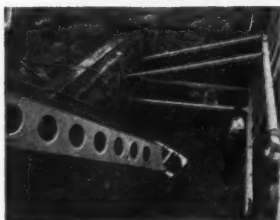


Photo above shows the rocks and concrete that had to be excavated.

THE JOB—a deep, narrow excavation for a big electrical transformer. To contractors, the accompanying photos tell the story better than words. "Thanks to that telescoping boom," said the construction engineer on this job, "it's the only machine that could do it."

The Gradall, with its versatility, mobility, and amazing precision is proving to be a labor-saver and time-saver, and a money maker on all kinds of jobs. Owners keep them mighty busy. Your Gradall distributors can furnish full information on mechanical details, on standard and specially built tools, prices, etc.

**Gradall Distributors
in over 60 principal cities
in the United States and Canada**

*Digging vertical walls in crowded
quarters, around sewers and other
utility lines called for utmost precision.*



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&
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**MORE LOADS
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Rear-Dump and Bottom-Dump "Eucs" are designed and built for moving earth and heavy excavation at the lowest cost per ton or yard on the toughest jobs. The simple but rugged construction of Euclids, combined with large capacity, ample power and speed, provide efficient off-the-highway hauling of any material.

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TO AMERICAN
INDUSTRY**

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"The fact we have to face today is that steel mills are operating on a hand-to-mouth basis as far as scrap is concerned. Some mills are working on only a two-day supply of scrap. We already have had to shut down steel-making furnaces for lack of scrap.

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B. F. Fairless

President, United States Steel Corporation

UNITED STATES STEEL

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IS MORE THAN A CHANGE OF BOOMS!

CONVERSION means more than changing a boom!
It means fitting a piece of equipment for a different class of work!

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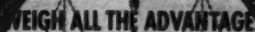
Real Convertibility is more than a change of booms!

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CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



WEIGH ALL THE ADVANTAGES

WHETHER SHOVEL, CRANE, DRAGLINE,
PULLSHOVEL or TRUCK CRANE

is there on every job!



Barber-

Redi-Fab series

BELT CONVEYORS



EASY

SELECTION FROM CATALOGED UNITS

Barber's Redi-Fab line of belt conveyors is the only line that has a specially designed unit for every conceivable conveyor use. That means you can handle every job—no matter how big or small it may be. These conveyors have been designed and constructed to last.

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QUOTATION, DELIVERY, ERECTION

Barber's Redi-Fab belt conveyors are designed to be erected quickly and easily. They are built to last. They are built to be used in the most difficult conditions. They are built to be used in the most difficult conditions. They are built to be used in the most difficult conditions.

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NOW

More than ever, machines must be used most effectively. Redi-Fab Conveyors offer the fast, sure way to release shovels, cranes, tractors and the like for more productive work—to minimize manpower requirements and increase productivity. Send for your copy of Redi-Fab Catalog RF.

see your B-G distributor

Greene

"PACKAGED" UNIT CONSTRUCTION

HERE ARE TYPICAL REDI-FAB PACKAGES...



Foot End—available factory-assembled, or in "packaged" components



Head End



Intermediate Section—panel package, frame package and carrier

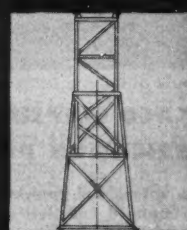
Redi-Fab "packages" are logical, convenient groups of parts—or factory-assembled components packed or bundled for individual shipment. This saves shipping costs, simplifies stocking, ordering, erection and future alterations.

All packages are clearly marked for easy assembly. All the engineering has been done at the factory. Your Redi-Fab Conveyor can be assembled quickly by a few semi-skilled men.

WIDE CHOICE OF COMPONENT EQUIPMENT & ACCESSORIES



—DRIVES—A complete line of drives from 1/2 to 100 horsepower, in either single or three phase, 115 or 230 volts, 60 or 50 cycles. Also available in 1000 and 2000 volt for special applications. Also available in 1000 and 2000 volt for special applications.



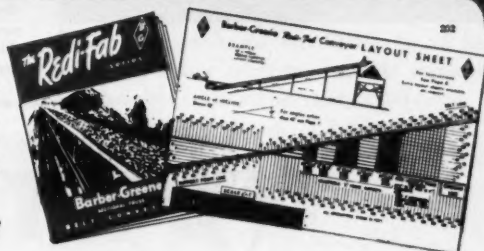
—ACCESSORIES—also Redi-Fab includes a complete line of accessories including: idler pulleys, rollers, guides, scrapers, etc. Also available in 1000 and 2000 volt for special applications.

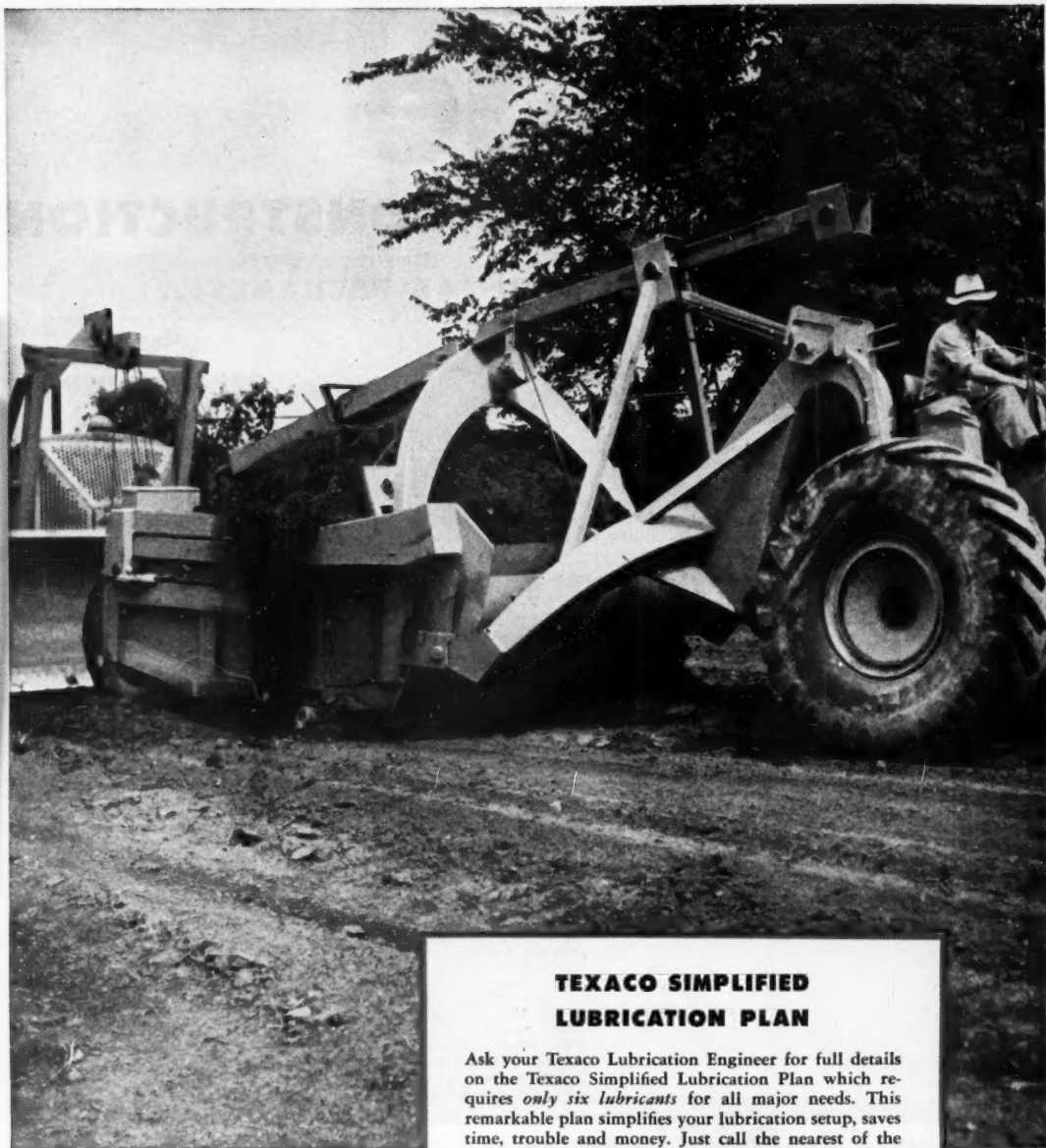


send for Redi-Fab catalog

The new 40-page catalog makes it simple for you to figure your own conveyor requirements if you wish. No knowledge of horsepower required. The catalog makes possible the proper selection of the conveyor with the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab Catalog, you can make your own layout—accurately, down through all details including locating the A-frame supports. Write for your copy, or ask your B-G distributor.

BARBER-GREENE COMPANY
AURORA, ILLINOIS, U. S. A.





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FROM EVERY ENGINE— DEPENDABLE



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AT LOWER COST

...when you lubricate with **TEXACO URSA OIL X****

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**Struck Capacity Increased to 16 yd.
— Greatest of the Self-Loading Scrapers**

On-the-job performance has proved that Bucyrus-Erie B-Type Scrapers beat competition by every standard of comparison . . . load size, speed and overall cost per yard. And now Bucyrus-Erie offers you an *improved* model — the B-170A — designed to help you boost output even more.

Retaining the best characteristics of its predecessor, the B-170A gives you such proved advantages as boiling-action loading — two-part or fixed apron easily converted for quick, clean dumping of any material—streamlined gooseneck for sharp turns, easy maneuvering.

And now . . . look at these outstanding new features:

NEW SIZE AND STRENGTH —
Boosting struck capacity from 15 to 16 yd. (21 yd. heaped) was achieved by effective redesigning . . . not just adding sideboards. The B-170A is a foot longer, weighs 20 percent more, maintains a low center of gravity for stability on slopes.

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Two combinations of large tires make it easy to fit local conditions, even on soft ground, meet Tire and Rim Association standards with low pressures. The larger rear tire combination (24.00 x 33) increases maximum depth of spread to 21 in.

NEW LOADING VISIBILITY —
Grate section in upper part of apron gives operator better view of bowl. Outside apron arms let apron close easily regardless of the type of material in the bowl.

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for the full story!**



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Bridges 33 years of

CONSTRUCTION PROGRESS



Thousands of trucks of all makes equipped with Perfection Hoists and Bodies have crossed this river over this bridge and others—helping to build the greatest city in the world.

Perfection Hoists and Bodies were on the job in 1918 — the start of the period of greatest development in construction and construction equipment in history. Records for size of structures and speed of completion continue to be made today.

Material haulage plays an important part in making these records — and PERFECTION leadership in truck body and hoist design is a vital part of this achievement.

That's why dealers and users know that where jobs are toughest—and where records are being made — there PERFECTION Bodies and Hoists will be found on the job. Write for literature.

Photo shows PERFECTION No. 354 Heavy-Duty Dump Body, length 192", width 96", capacity 16 cu. yds. PERFECTION "in-side-braced" construction gives greatest possible capacity in relation to overall size of platform. Equipped with No. 1027 Iso-Hydraulic Roll-A-Lift.

PERFECTION
STAKE and DUMP BODIES
HYDRAULIC HOISTS

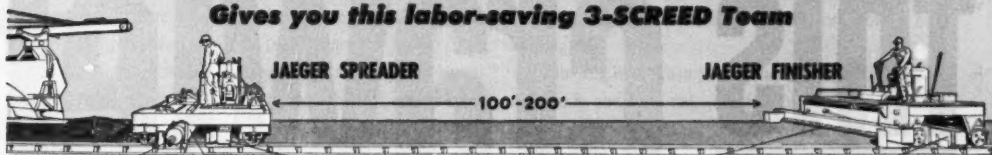


FOR ANY TRUCK
STANDARD or SPECIAL UNITS
IN ALL SIZES • FOR ANY USE

Engineered and Manufactured by
THE PERFECTION STEEL BODY CO.
Galion, Ohio, U.S.A.

Jaeger locates the missing screed immediately behind your paver

Gives you this labor-saving 3-SCREED Team



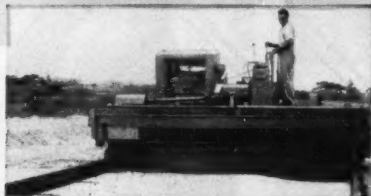
Re-mixing spreader screw: Reworks, compacts and spreads material evenly from form to form.

Initial strike-off to approximate grade (all that any other spreader can accomplish.)

No. 1 — Metering screed: Makes precision strike-off with 12" oscillating shoe. Corrects any excess or deficiency left by initial strike-off. Saves cost of shovels for carry-back and for costlier back-tracking with the paver.

No. 2 — Transverse Screed: Works with just the right roll of material as "metered" by the Spreader. No piles to buck. Uniform compaction at all times.

No. 3 — Diagonal Screeds: Pivots to any angle needed to carry material up-hill on pitched slab or super-elevated curves, compacts it solidly against higher form. Corrects any irregularities left by transverse screed because it meets material at different point. Also finishes stiff mixes without tearing.



Spreader screw and strike-off do the heavy work: Powerful screw easily knocks down biggest piles, re-mixes and densifies the material, spreads it evenly from form to form. Adjustable plate then makes initial strike-off.

Added metering screed then makes precision strike-off: Oscillating 12" screed (*the screed that's missing from all other spreaders*) meters just the right amount of material needed for final finishing. No later carry-back, no high spots. Finisher can safely wait until surface is properly conditioned.


Double screed finisher (using diagonal screed as needed) completes finish: Note the small, accurately metered roll of material always ahead of the finisher. Means always uniform compaction under the screeds; easier, better finishing. Has eliminated second finisher where required in several States. On pitched slab and super-elevated curves Jaeger diagonal rear screed finishes perfectly to the higher form.

For new or rental equipment, and the service to keep rolling, see your Jaeger distributor

THE JAEGER MACHINE COMPANY

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nothing slow about this crawler



"BIG RED" DIGS IN. The International TD-24 dozes through tough going faster, pushes bigger bladefuls farther, moves more pay-dirt per day. It's the "Champ" for sure!



Read what makes International's TD-24—the Big Red “Champ”—finish ahead of the field!

Man or machine, it takes speed and strength and stamina to take on all comers and leave 'em trailing behind. It takes guts and power to spare to be the “Champ.”

In a human, it means running a faster race, hitting a harder ball, fighting a tougher fight. In the TD-24, it means doing more work in less time than any other crawler on the market.

More speed—8 forward and 8 reverse speeds up to 7.8 mph for faster time cycles on the job.

More power—148 maximum drawbar horsepower—to take

a bigger load on the scraper, a bigger bite on the blade and move dirt faster, easier, cheaper.

More flexibility—synchromesh shifting “on the go”—instant change up or down one speed without declutching—Planet Power steering for pivot turns, feathered turns, turns with power on both tracks.

The TD-24 gets in and out and back in again faster—moves more dirt each time—makes more money for its owner every working day.

It's the Big Red “Champ” any way you look at it.

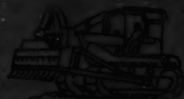
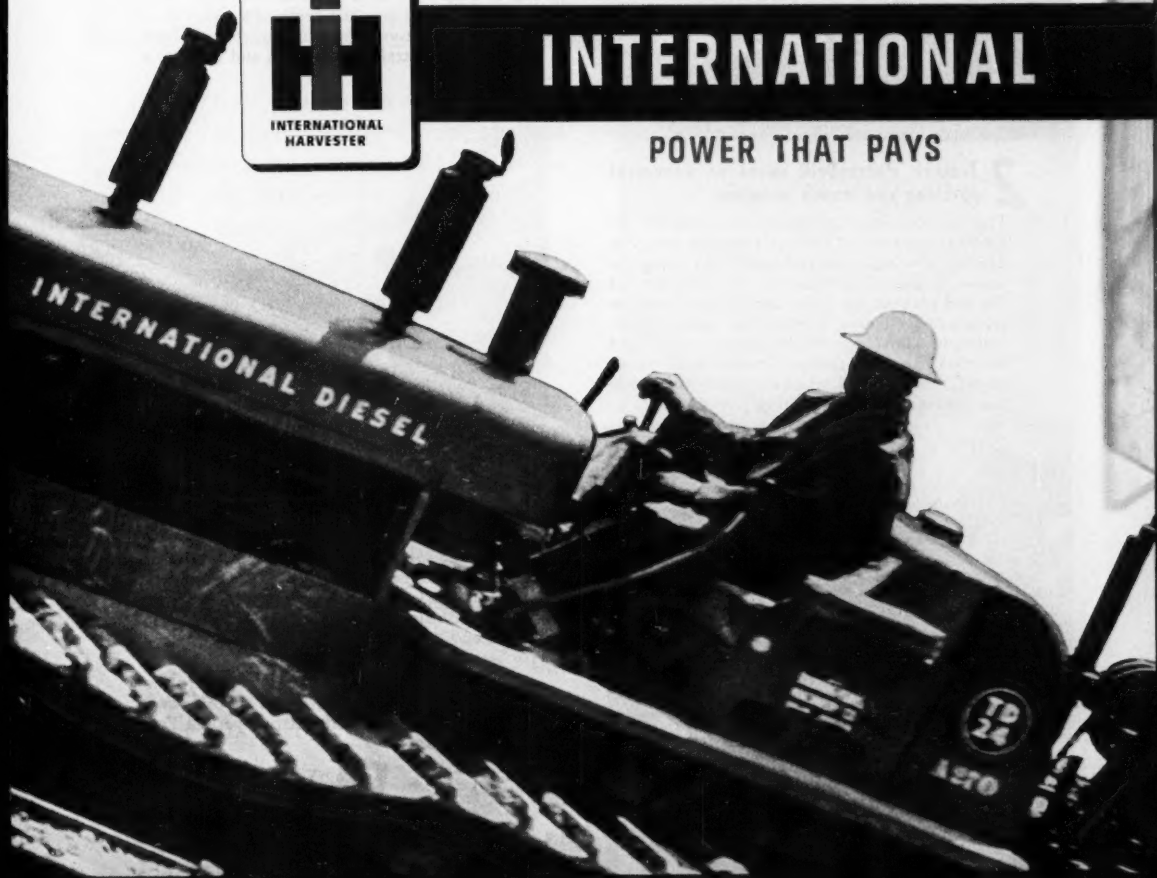
Come in and look. Ask your International Industrial Distributor for the low-down. Find out about his fast-moving parts and service setup, which will keep your International power on the job for years to come. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL

POWER THAT PAYS



3 New Ways to Cut Costs with Le Roi TRACTAIR (Tractor-Compressor)

Tractair with its combination tractor-105 compressor feature and its many attachments has provided money-saving usefulness for contrac-

tors, utilities, and municipalities everywhere. Here are 3 new attachments that have already proved their ability to reduce costs:

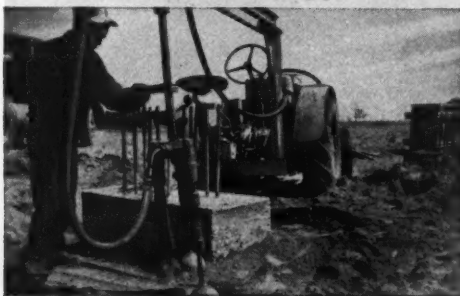
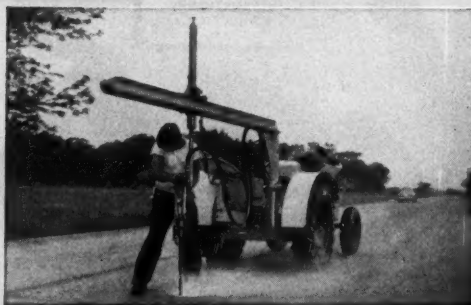


1 Tractair Backhoe saves on small digging jobs

It gives you air power for breaking through pavement, frost, or running other air tools. Then the hydraulic backhoe takes over — does your digging fast and easy to a depth of 8 feet. Plenty of power for roots, broken concrete or hard ground. Digs straight end walls and loads to a height of 6'2".

2 Tractair Patch-Drill saves on pavement patching and trench opening

This unit consists of an air-feed Le Roi-CLEVELAND H-10 sinker (45 lb). It permits easy, fast drilling of a succession of holes. Then, using the same machine, all you have to do is broach out the web between the holes and lift out the entire section of pavement. There is no loading problem — no shoveling. Holes can be drilled and broached in an 8' radius. Tractair supplies air power, mobility, and, when equipped with front-end loader attachment, lifting power, too.



3 Tractair Multiple Tamper saves on tamping operations

Thanks to Tractair mobility, the tamping effectiveness of the Le Roi-CLEVELAND 3-Tamper arrangement and work-saving air feed, this unit can keep up with three men shoveling or a back-filling tractor. Not only is tamping faster and easier, but you also get better compaction and lower costs.

Learn more about the money-saving usefulness of Tractair for your own type of work. Send today for the 70-page, information-packed Tractair application book.

Tear out this coupon and mail TODAY!

LE ROI COMPANY

Dept. CM-8, 1748 So. 48th Street, Milwaukee 14, Wisconsin

I want to know more about Tractair's ability to cut costs. Please send me your new 70-page Tractair Application Book.

Name _____ Title _____

Company _____

Address _____

City _____ () State _____

7-10



LE ROI COMPANY

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Plants: Milwaukee • Cleveland • Greenwich, Ohio

From Start to Finish... **YOU'RE TIME AND MONEY AHEAD**



with **Firestone** **TIRES**

WHEN you start a job, you want to get it done in the shortest possible time at the lowest possible cost. The kind of tires you use has a lot to do with both.

When you buy Firestones, you pay no more than you do for other tires. But you **GET** more — more rubber in the treads . . . You get double-thick, cut resistant sidewalls. You get four extra plies that protect the Gum-Dipped cord bodies, which can be retreaded again and again. And you get more service from your Firestone Dealer or Store.

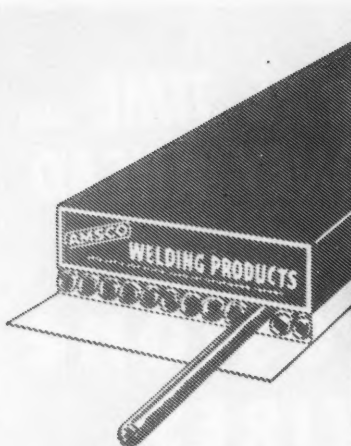
Add up these advantages. They mean more hours of service . . . less delays and downtime. You're time and money ahead with Firestone Tires on your equipment.

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

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**ALWAYS SPECIFY FIRESTONE TIRES
WHEN BUYING NEW EQUIPMENT**





How AMSCOATING with Amsco
Hardfacing Rods saves you materials
... manpower ... money.



AMSCOATING...saves hundreds of dollars per month in pulverizing!

AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion...

Find out how AMSCOATING can save you materials... manpower... money!

A large Pennsylvania brick company was faced with this problem: pulverizer plows wearing out every two weeks due to extreme abrasion of clay with a high silica content. An expensive period of down-time and replacement labor resulted.

In trying to stop this high replacement cost, a test was made. Each plow was AMSCOATED with an Amsco® rod specially developed for high resistance to abrasive wear.

Result? The Amscoated plows lasted 4 times as long... 3 out of every four replacement jobs were eliminated! The saving amounted to several hundred dollars each month!

AMSCOATING permits big savings—through longer service and fewer replacements—on many other applications. If you have an equipment part that's subject to wear, the possible savings—to you—are too big to be overlooked!

Write today for illustrated catalog—and nearest distributor's name.



AMSCOATING

THE RIGHT WAY TO SAY HARDFACING

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Brake Shoe

COMPANY

AMERICAN MANGANESE STEEL DIVISION

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Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Speed-Power-Guts-

Thew
TL-25
Lorain

Lorain TL-25 machines have all of these important profit-making qualities . . . **SPEED** — responsive clutches and rapid acceleration save seconds per trip, and more trips per day mean more yardage . . . **POWER** — abundant power from a "plus" engine is delivered by a high-efficiency transmission to just where you want it, when you want it . . . **GUTS** — if you mean ability to take punishment and to hang-on relentlessly until the job is done, "TL-25's" have it . . . or if you mean the "insides" of the machine, "TL-25's" again have it in advanced design and construction that give you these features . . .

• IT'S A COMPLETE PACKAGE—NO EXTRAS TO BUY • INTERCHANGEABLE "PACKAGED" COMPONENTS—FAST, EASY TO SERVICE • 5 IDENTICAL CLUTCHES • ONE-PIECE BED • OIL-ENCLOSED CUT GEARS • INTERCHANGEABLE PARTS • ANTI-FRICTION BEARINGS • HOOK ROLLERS • QUIET, SMOOTH OPERATION • 7 MODELS TO CHOOSE FROM—3 CRAWLERS (STD., EXTRA-LONG OR EXTRA-WIDE) AND 4 RUBBER-TIRE MOUNTINGS

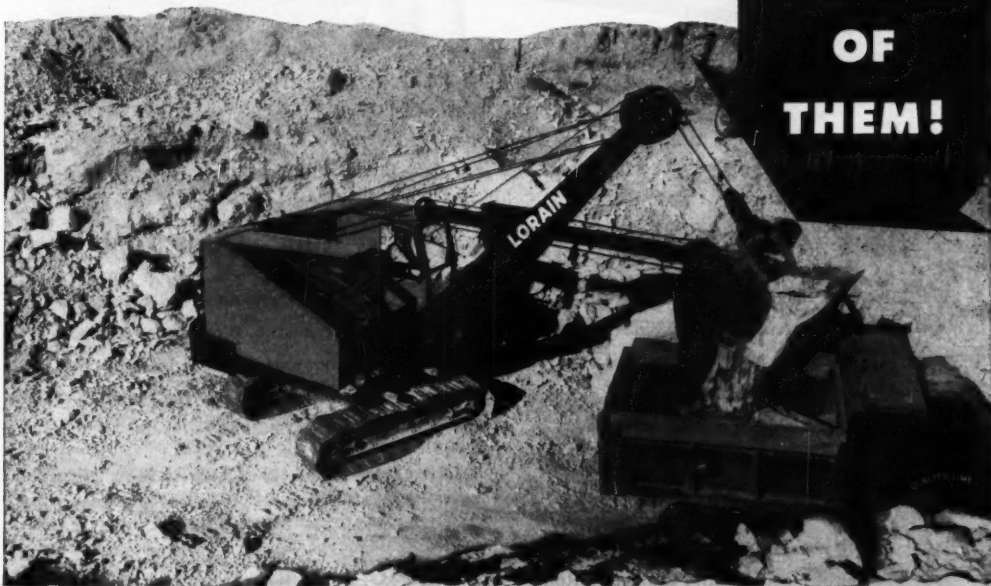
Your nearest Thew-Lorain Distributor can show you these TL-25 features at work!

THE THEW SHOVEL CO., LORAIN, OHIO

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**SHOVELS • CRANES
HOES • DRAGLINES
CLAMSHELLS
ON CRAWLERS OR RUBBER-TIRES**

DIAMOND Roller Chain Drives On The Cleveland Baby Digger #92



Diamond Roller Chain applications as follows:—

Crawler Transmission Drive:
Diamond Double 433

Digging Wheel Drives:
(one on each side)
Diamond Single 434

Hoist Transmission Drive:
Diamond Single 433

Conveyor Drives:
Diamond Single 434

Help Maintain the "On Time-Every Time" Operation

● Trench production requires long-time fast operation with strength, power and reliability in every part of the machine.

Cleveland's No. 92 Baby Digger is a compact, tough trencher with power transfer provided by high strength Diamond Roller Chains. These drives include the crawler transmission, hoist transmission—digging wheel and conveyor drives.

Since the development of modern construction and excavating equipment, Diamond Roller

Chains have been widely preferred because of the uniformity of quality, proven long-life performance and the great reserve strength that add so much to economical performance, low cost high yardage and output.

DIAMOND CHAIN COMPANY, Inc.
Dept. 418, 402 Kentucky Ave., Indianapolis 7, Indiana

Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER



DIAMOND



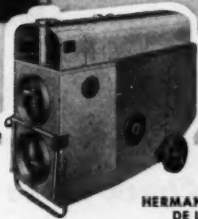
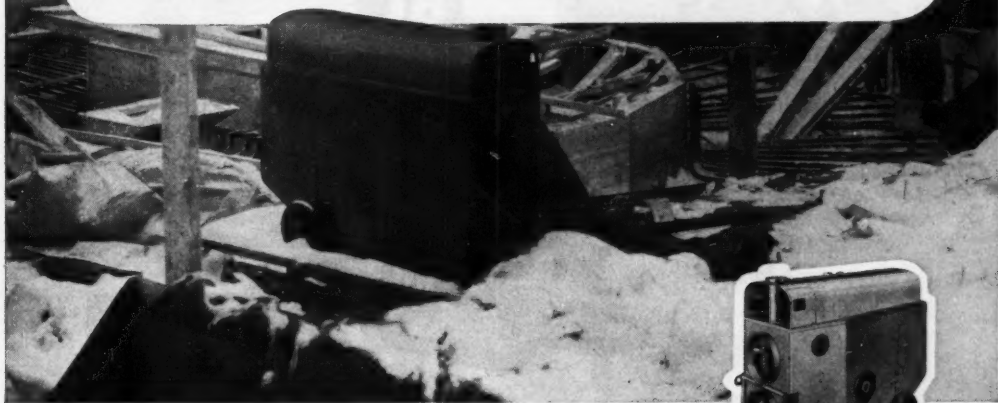
ROLLER CHAINS





My jobs moved along in the Toughest Weather

...thanks to Herman Nelson Safe Portable Heaters



HERMAN NELSON
DE LUXE I

Capacity 280,000-450,000 BTU/hr • Completely automatic, including temperature control • Fresh air delivery 3,000-2,350 cfm • Electric motor powered.

"Remember last winter? My construction schedules were completely shot until I equipped with Herman Nelson heaters. From then on the jobs moved along even in the toughest weather. Believe me, I found the answer to winter slow-downs . . . and I'll be ready for this one coming up."

Another construction man has learned to lick *bad weather* job-lag with modern heating methods. Herman Nelson portable heaters supply Quick-Clean-Safe *heat* where you want it and when you need it . . . to keep construction rolling. These adaptable mobile units heat, dry, thaw and ventilate without expelling dangerous fumes, smoke and carbon monoxide into enclosed working areas. They're absolutely safe as well as efficient. The secret is Herman Nelson's unique "sealed flame" principle and forced-air ventilation found in *no other* portable heating device.

To add weeks of working weather to your winter construction schedule, let us show you why construction engineers and contractors are investing in Herman Nelson portable heaters. For full information write Dept. CM-8.



HERMAN NELSON
ECONOMY MODEL

Priced lower for smaller jobs • Capacity 125,000-190,000 BTU/hr • For 115/230 volts A.C. • Costs but 19¢ per hour to operate.



HERMAN NELSON
STANDARD MODEL

Capacity 250,000-385,000 BTU/hr • Gasoline engine powered • Completely self-contained • For areas lacking electricity.

AAF



HERMAN NELSON

Division of AMERICAN AIR FILTER COMPANY, INC.

MOLINE, ILLINOIS

SIMPLIFIED

Austin Overshot Loader



Check these outstanding features:

Drive...simple, positive; no cable or hydraulic drives; wears longer.

Front Power Takeoff...gives live bucket without master clutch being engaged; accurate control; easier to operate.

Mounts on Main Frame of Tractor

Doesn't Interfere With Servicing of Tractor

Pre-Assembled...entire drive unit is assembled and adjusted at factory—ready for you to put on.

Doesn't Interfere With Drawbar

Automatic Control...bucket stops automatically in dumping position.

Brake Control...hydraulic brake on rear spool shaft to control speed of bucket return.

Uses No. 24 Cat P.C.U.

Good Visibility for Operator

Easily Converted to Dozer in 20 Minutes

SPECIFICATIONS

MODEL 6 C

Fits wide gauge, non-oscillating D6, without modification. Wide gauge, oscillating D6 can be modified to accommodate the 6C.

Standard Bucket Capacity in cubic yards (rated)1½

Bucket width6' Overall height18' 4"
(bucket raised)

Overall width9' Overall length20' 8"
(bucket lowered)

No. of bucket teeth6 Loading cycle
(seconds)15

Dumping clearance...8' 1" Weight (approx.
pounds)9,500

Overall height8' 2"
(bucket lowered)

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IT SHOWS YOU HOW TO BE
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UNITED STATES STEEL

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It covers all industries—construction, mining, petroleum, marine—even aircraft control cable. There are numerous photographs, plus listings of equipment and the types of wire rope that should be used.

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Cleveland 13, Ohio

Please send me your Recommendation Booklet, "The Right Rope for the Job."

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Company.....

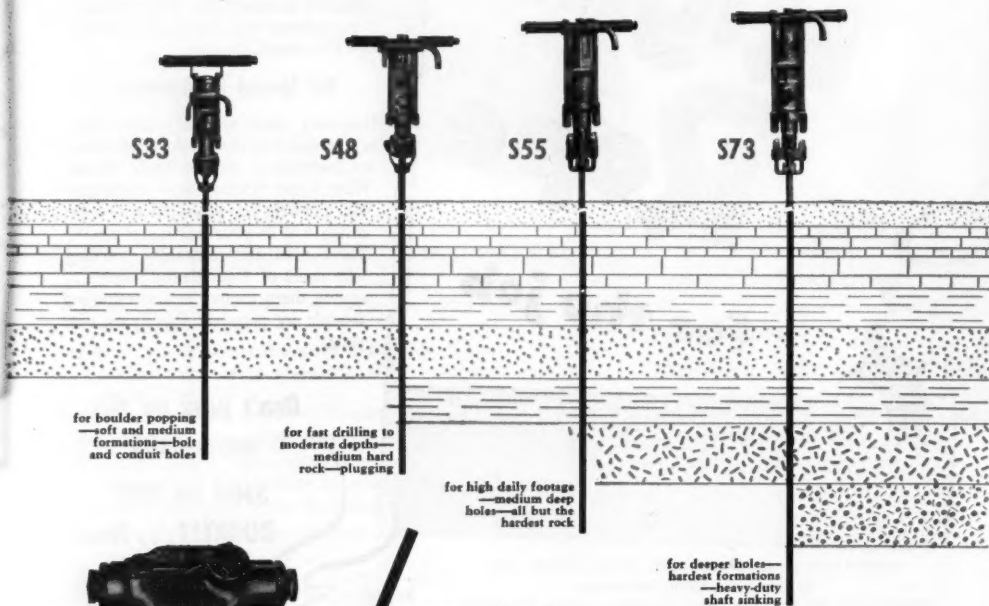
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any kind of rock costs less to drill with **GARDNER-DENVER sinkers**

No matter what kind of rock you find underfoot—there's a Gardner-Denver Sinker of the correct weight and power for lower drilling costs. Every model is designed for fast penetration—powerful rotation—clean blowing—easy holding—low air consumption. Bulletin HHD-11 gives all the facts. Send for your copy today.



Drills can't run dry when the LO12 Automatic Oiler guards your air lines. It stops the flow of air when it runs out of oil.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

Mechanical soldiers need good shoes, too!

THESE are days of grave concerns . . . of conservation and mobilization for strengthening the nation's defense—for the survival of our national economy—for the continuance of useful highway, airfield, dam-site, reclamation and other construction programs—for the keeping of every home-front machine in condition to stay on the job until its replacement again becomes a normal procedure.

That includes *your* equipment and emphasizes *your* responsibilities. To benefit fully from the productive life that has been built into your "Caterpillar" equipment, you must be alert to its needs as time and hard usage take their toll in wear and depreciation. For instance:

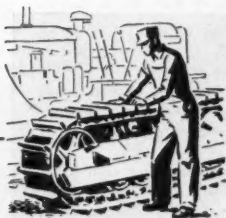
How are your "Caterpillar" track shoes?

Tough as they are, they can't battle rocks, shale, jolts and grinds forever. Growing shortages in the premium steels that go into them may make early replacements difficult—and extra care of track parts something to think about.

CATERPILLAR, PEORIA, ILLINOIS



**DO
THIS
NOW**



YOU'RE THE DOCTOR. Check those sprockets, grousers, rollers, idlers, pins, links and bushings. Proper track adjustment minimizes wear. Sprockets may need switching from side to side, and pins and bushings need turning, to provide new wearing surfaces. Shoes serve longer if you have worn grousers built up before excessive wear occurs.

Reread your Operator's Instruction Book. Anticipate your future parts requirements. Take the facts to your "Caterpillar" dealer. His modern facilities and skilled servicemen are at your disposal. He can rebuild many parts to keep your machines on the job. Their added life will repay the reconditioning cost over and over.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



Hi-Speed DESIGN CUTS BATCHING TIME

Extra-wide, 15" x 36", all valves on Johnson "Hi-Speed" Batcher and wide bin-type openings reduce charging time . . . steep slopes of the 4-compartment, truck-mixer-type hopper give fast, clean discharge into 19" collector ring.

Flexible Johnson Roadbuilders All-Welded 30 can be arranged for 1 or 2 multiple-material "Hi-Speed" 34 Roadbuilders Batcher or truck-mixer charging Batcher in 2, 3 or 4 yd. size. Transmittal Plant shown.

ACCURATE • *Hi-Speed* • FLEXIBLE FOR BATCHING 2, 3 OR 4 MATERIALS

With more than double the filling area of most batchers, Johnson "Hi-Speed" Roadbuilders Batcher save important seconds in charging time. Big 15" x 36" valves are fast-filling . . . flexible, can be added or removed as needed to handle 2, 3 or 4 materials. For charging into truck mixers, "Hi-Speed" Batcher (illustrated) has a cement plug valve in place of one of the 4 aggregate fill valves. Truck-mixer-type weigh-hopper, available in 2, 3 or 4-yard sizes, has 4 compartments . . . 1 for sand, 2 for aggregates, and 1 enclosed compartment for cement. Double-clam discharge gate is easily tripped, opens wide . . . steep slopes of hopper give fast discharge.

A wide-discharge hopper, for standard 34-E paver batch, is readily interchangeable with truck-mixer hopper on same scale frame. Overhead unit frame supports all fill valves, hand levers, hopper and weigh-beam box . . . provides convenient reassembly, insures accurate alignment of scale parts at all times.

For top batching speed on your jobs, plus extremely accurate weighing for uniform strength every batch, use Johnson "Hi-Speed" Batcher. Call your Johnson distributor today, or write direct to . . .

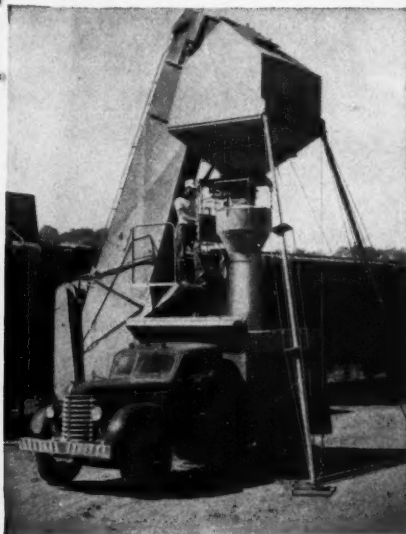
C. S. JOHNSON CO., CHAMPAIGN, ILL.

(Koehring Subsidiary)

CJ102



JOHNSON Roadbuilders BATCHERS

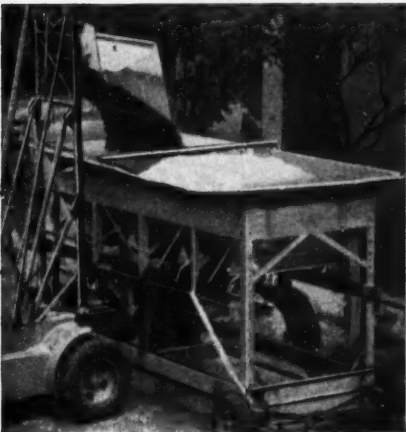


▲ MULTIPLE-PURPOSE JOHNSON ELEVATING CEMENT CHARGER

can be used as a batch plant or transfer plant. For batching, standard Charger has a size 14, 1000-lb. cap. cement weigh batcher, hung under a 33-bbl. storage hopper. To charge dual-batch trucks, two 1000-lb. batchers can be used. Converts to transfer plant by removing batchers and cone, and bolting a 50-bbl. extension to the hopper.

▼ 8, 20, OR 30-TON CAPACITY LO-BIN TROLLEY BATCHER

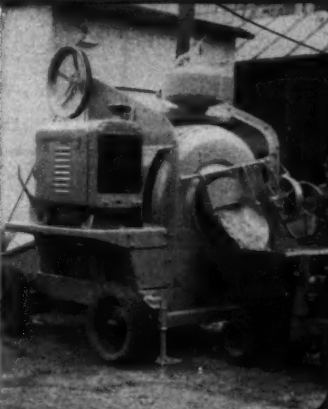
is only 7½' to 9½' high for easy charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weight beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Wheels, pneumatic tires and handy tow-bar are optional.



NEW TRUCKS OR KWIK-MIX 16-S DANDIE

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive re-mixing action, Flow-Line discharge. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar, mixers, power wheelbarrow

KWIK-MIX (Koehring
Subsidiary)
Port Washington, Wis.



"CURB-BUGGING" Parsons 221 Trenchliner

With shiftable boom for digging within 10" of side obstructions, and reversible power-shift spoil conveyor that shifts through machine in less than 1 min., Parsons 221 Trenchliner hugs curbs, poles and buildings without swerving from grade line. It digs 16 to 36" wide . . . 8'-6" deep. With full reverse, the 221 makes vertical set-ins, undercuts sidewalks, sewers, old mains. Ask about 4 other sizes.

PARSONS (Koehring
Subsidiary)
Newton, Iowa



MORE WORK-TIME with Koehring Dumptor

With more than a ton Dumptor strength for every ton of payload capacity, Koehring 6-yd. Dumptor withstands severest loading shocks. Sides, end and triple-strength bottom of all-welded body are heavily reinforced. Gravity dump eliminates body hoist maintenance. Same forward and reverse travel speed gives fast shuttle hauling. Check Koehring excavators and cranes.

KOEHRING COMPANY
Milwaukee 16, Wis.





Philip E. Soyars, County Commissioner, Precinct 3, says,

"We're well pleased with our two Athey Force-Feed Loaders. both are working out fine."



E. A. Lyons, County Commissioner, Precinct 4, says,

"Our Athey Loaders have saved thousands of man hours - they're our best pieces of equipment!"



H. A. May, County Commissioner, Precinct 2, states,

"That Athey Force-Feed Loader is the best doggone loader on the market!"



W. K. Chapman, County Commissioner, Precinct 1, says,

"These Loaders are undoubtedly the greatest labor saver in our precinct!"

HARRIS COUNTY, TEXAS

ALL OUT FOR Athey FORCE-FEED LOADERS!

7 Force-Feed Loaders Earn the Praise of County Officials

When every road official of a county is enthusiastic in the praise of a machine — *it must be good!*

Every road official of Harris County, Texas, gives his highest commendation to the 7 Athey Force-Feed Loaders, owned and operated by the county. The first unit was purchased in May 1945 and its record of performance and dollar savings led to the purchase of 6 more Athey Force-Feed Loaders!

There are good reasons for this praise and trust in Athey Force-Feed Loaders . . . reasons we would like to show you and tell you about. Stop in at your Athey-"Caterpillar" dealer and see the outstanding design, the superior construction, the work-ability of the Force-Feed Loader — today!

ATHEY PRODUCTS CORPORATION
5631 West 65th St., Chicago 38, Illinois

Harris County Force-Feed Loaders are used to load surplus dirt from ditch cleaning operations, to load native road building materials, to load stock-piled road repair materials, to load surplus dirt from "high shoulders" on roads — and other tasks that save thousands of dollars for the County.



Athey

Force-Feed Loader



Here's the POWER you want on your job... plus DEPENDABILITY

Whether you're hauling dirt, spreading asphalt, or doing one of many other rugged jobs, you want a truck that fits the job—and provides plenty of low-cost power. Such a truck is a Dodge "Job-Rated" truck.

New Dodge "Job-Rated" trucks provide more power than before. On 2 1/2-ton models, for instance, Dodge now offers a new 114 hp engine . . . the most powerful Dodge engine ever available in that field. And on high-tonnage models twin carburetion and exhaust system gives you plenty of extra power with extra economy.

And talk about maneuverability! Shorter turning diameters and new worm-and-roller steering gears on many models make the new Dodge "Job-Rated" trucks far easier to handle.

If it's dependability you're after, (and who isn't?) you'll go for features like the new Dodge moistureproof ignition and the new high-torque capacity starting motor. They help make starting easier in bad weather.

There's a Dodge "Job-Rated" truck to fit your need *exactly*. Get the proof from your nearby Dodge dealer today.

How Dodge Trucks are "Job-Rated" for the Construction Business

A Dodge "Job-Rated" truck is engineered *at the factory* to fit a specific job . . . save you money . . . last longer.

Every unit from engine to rear axle is "Job-Rated"—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

Every unit that SUPPORTS the load—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

Every unit that MOVES the load—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.

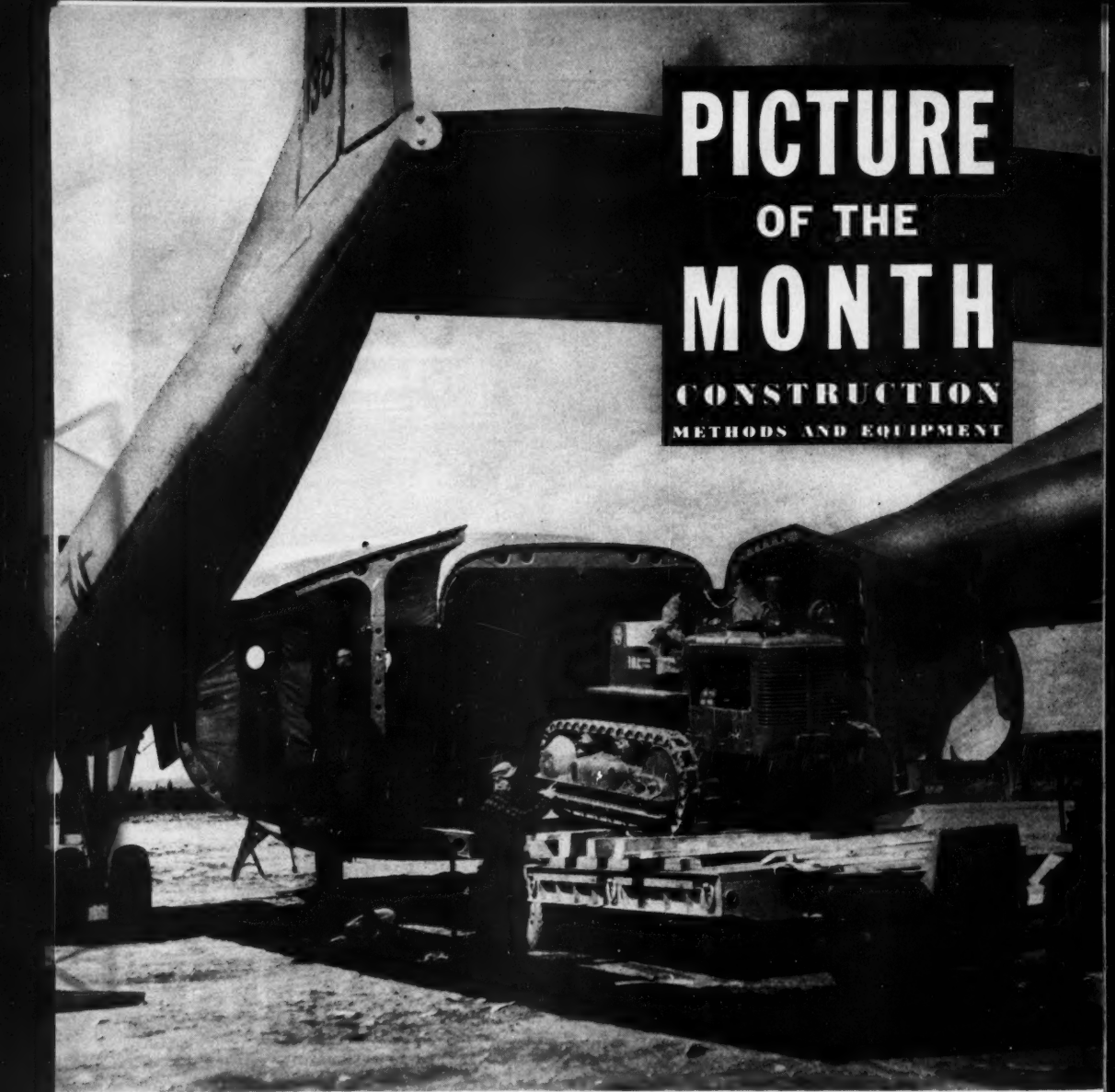


DODGE

"Job-Rated"

TRUCKS

"Job-Rated" TRUCKS DO THE MOST FOR YOU



PICTURE OF THE MONTH

CONSTRUCTION
METHODS AND EQUIPMENT

International TD-14's Take to the Air

NOTHING — not even 320 mi of trackless wastes — can stop construction men from moving in and getting the job started. To start development of the Labrador iron ore deposits, the Iron Ore Company moved in by air, taking along 15 International TD14 tractors, Bucyrus-Erie 8-yd scrapers, and a lot of auxiliary equipment. The rigs, one at a time, were flown from the St. Lawrence at Seven Islands, Que., to Knob Lake, Labrador, in a Fairchild Flying Boxcar borrowed from the U.S. Air Corps. Here's a tractor being delivered at Knob Lake, minus its treads which had to be removed to make the machine fit into the plane. For more details see the article on page 40 this issue.— International Harvester photo



Better for structural concrete

Duraplastic is so often specified for structural work because it gives a more plastic, more cohesive mix that is more workable and easy to place. Duraplastic air-entraining portland cement needs less mixing water for any given slump.

Makes more durable concrete

Water-gain and segregation are minimized by the air-entraining feature of Duraplastic. The finished concrete is thus fortified against the effects of freezing-thawing weather and the surface appearance is improved.



YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

Makes Better Concrete at No Extra Cost



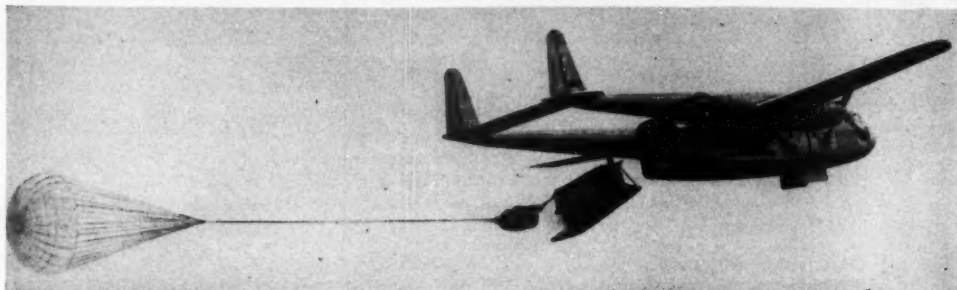
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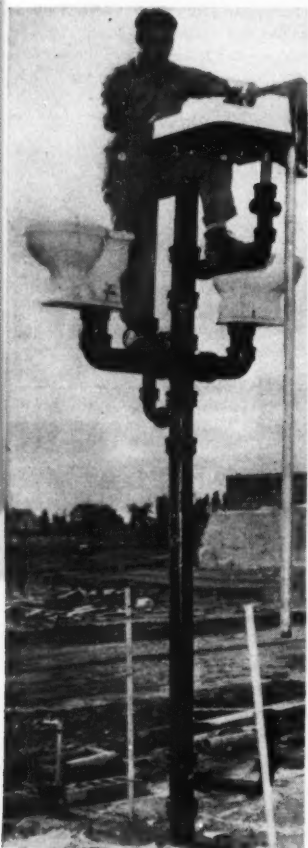
CM-D-125

Construction News in Pictures . . .

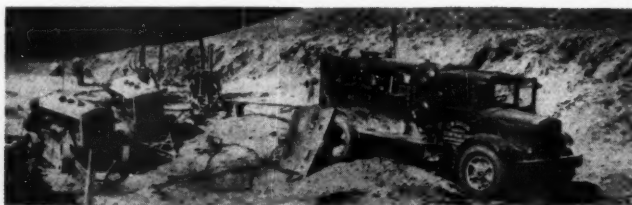


GOING DOWN — A 9½-ton bulldozer, heaviest piece of machinery dropped to date by Air Forces, flips from rear of cargo plane for successful descent to troops below.

Small extraction parachute (left) has pulled platform-mounted dozer clear of plane, while six larger chutes in bundle near machine will open to lower the rig and land it without damage.—Wide World photo



GOING UP — Plumbing for McDonough Homes, St. Paul (Minn.), low-rent housing project, goes up before concrete walls are poured. This is special unit: Usually toilets and basins are added later. Plumbing contractor is Reuben L. Anderson, Inc.—Wide World photo

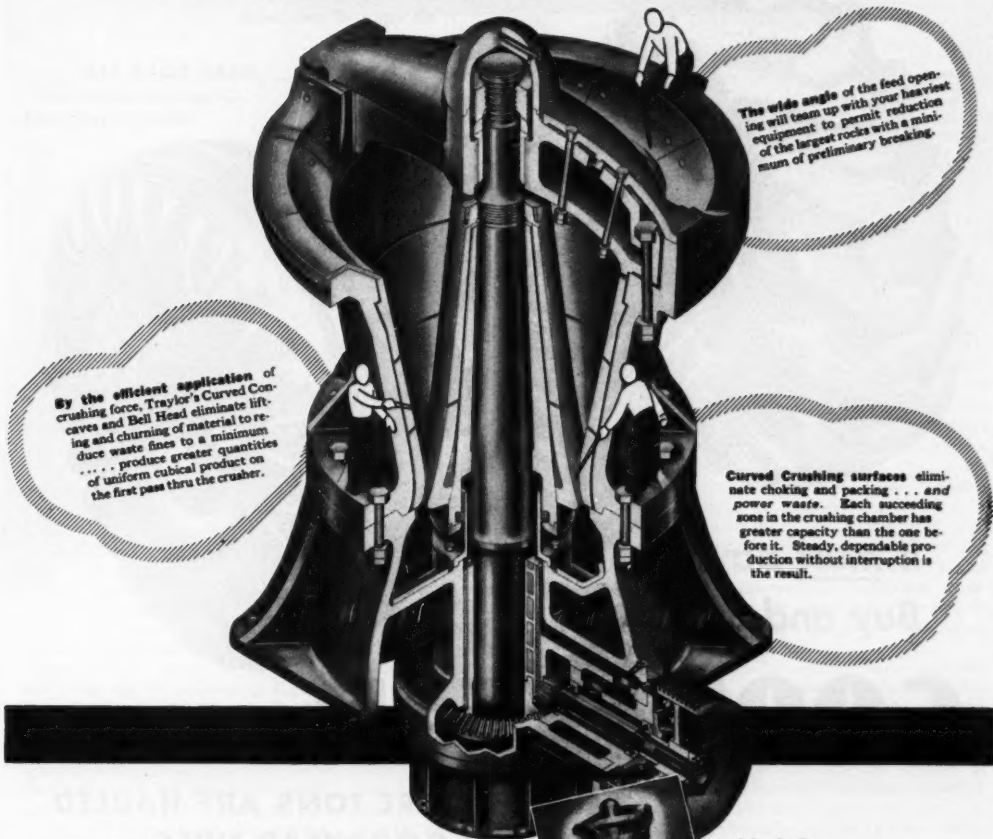


PORTABLE PORTABLE — When C. W. Good, contractor from Reading and Lancaster, Pa., recently acquired a spanking new diesel-drive supercharged 600-ft Schramm portable compressor he made it really portable by mounting it on a truck. Here, the new rig works with three of its steel-wheeled predecessors (one's behind the truck) on a mean cut through tough folded shale for Pennsylvania's improved Route 100.



HURRY-UP JOB — Not a scene from Korea or some other war-torn land, this is the sprawling ground of Fort Devens, Mass. When a timber bridge over the Nashua River burned down, direct connection was lost with army camp's Lovell General Hospital. Regimental combat engineer outfit stationed there hurriedly set up a parallel 500-ft single-double Bailey bridge, providing access and also solving field erection problem. Berke-Moore Co., Boston, is building new steel and concrete bridge to replace burned span.

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Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Harold W. Richardson, Editor

What Price Construction?

...or How Silly Can We Get!

ALL YOU CONTRACTORS who are contemplating bidding the 10-million-yard Folsom Dam on California's American River for the Sacramento District, Corps of Engineers, on August 31, had better rush right down to the nearest shoemaker and learn how to figure your prices. Fantastic? Nope, just legal. Here's the dope:

On May 11 the Office of Price Stabilization issued Ceiling Price Regulation 34 covering services and service agencies. Shortly afterwards, chief counsel in the department ruled that construction is a service, and therefore comes under CPR 34. About the same time out comes the OPS Guide to Ceiling Price Regulation 34 for Service Trades. And this illuminating document cites as an example the service charges of Good Shoe Repair Co. Yep, there you'll find prime and fine half soles sewed, nailed and cemented, heel and toe plates, and dyeing shoes—but nothing about concrete, excavation, piledriving, tunneling, steel erection, cofferdams and such things.

The fact that construction wasn't contemplated in the original order is revealed by a glowing press release we received announcing CPR 34 that started off: "OPS today placed over 10 billion dollars worth of commercial and personal services . . . under a ceiling price regulation separate from the general price freeze of January 26." Hell's Bells, Mike, new construction last year topped 28 billions. Comparing Folsom Dam alone with Good Shoe Repair Co., the Army Engineers are charging \$150 for a set of plans from which the contractor can decide if he wants to bet on the job, and that's 100 shoe repair jobs. And, furthermore, they are demanding a million bucks in bid bonds as evidence of good faith in the prices the contractor does sub-

mit. Construction is big business, far beyond that of half-soling shoes.

What is the price of construction? If it were a standard article, perhaps we could figure a ceiling price. But nothing a contractor is asked to bid on is exactly like anything he ever did before, for no two jobs are alike or are built under the same conditions. Bids are not prices based on tangible costs—they are bets. The contractor bets he can move a yard of dirt from here to there at a certain price without going broke, even if the dirt is hard to get at, hard to handle, and hard to hold in place. He bets he can mix and place a yard of concrete within forms like he has never had to build before at a price less than his competitive better. He bets he can build a sewer through swampy ground for so much per ft, though he never tackled a swamp before. Ceiling prices? Nonsense, his bids are cellar floor prices determined only by his guts, ingenuity and judgment based upon experience.

The rules of procedure outlined in CPR 34 cannot be applied to construction. You're supposed to use the period, December 17, 1950 to January 25, 1951, as base. If you didn't bid Folsom Dam then, you must bid no more than what your nearest competitor bid. If there was no competition—or no Folsom Dam coming up last December—you're supposed to bid no more than you would have bid had you bid the job during the base period. Seems awful silly to us.

Some attempt has already been made to control prices on cost-plus-fixed-fee operations. Listen, Mike, cost plus contracts are only resorted to when the costs and conditions are so indeterminate that no one can foretell the results. Here the owner takes the risk, in lieu of paying for excessive con-

tingencies that would certainly run the bids way up out of all reason—if he could find anyone willing to bet even that high. Cost-plus-fixed-fee contracts are in themselves the best ceiling price regulations that could be devised for construction operation costs impossible to figure in advance.

Contracting has always been well regulated price-wise by the traditional system of competitive bidding. The low bidder automatically establishes a ceiling price for every job according to the particular conditions that apply only to that job.

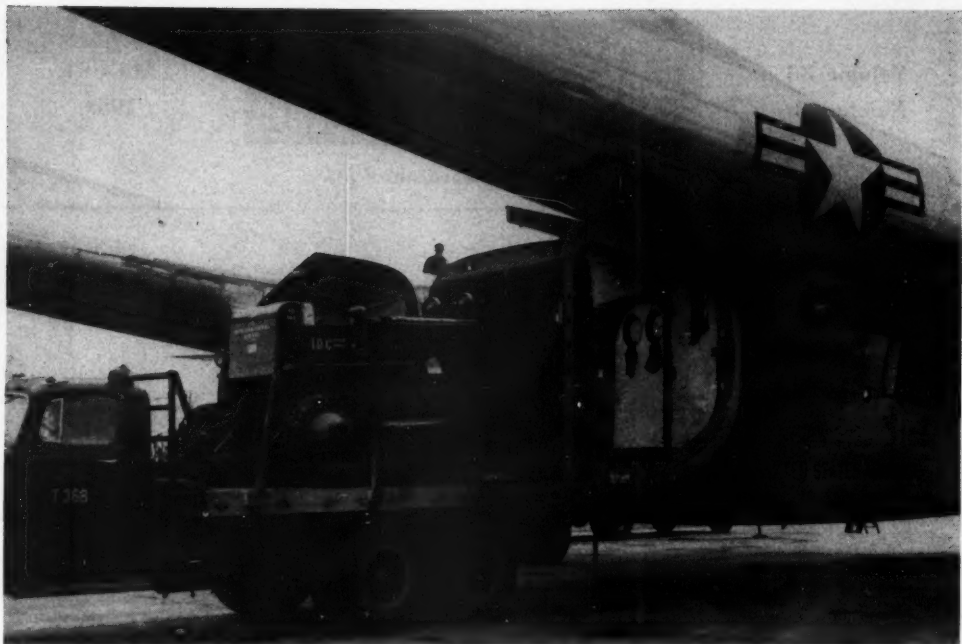
Within the next few days (from this writing) a Construction Industry Advisory Committee will meet with OPS to discuss the unworkable, impossible regulations CPR 34 imposes upon us. Perhaps by the time this appears in print the order will have been rescinded. If not, let's keep fighting this silly idea.

Construction isn't being ornery, Mike DiSalle, it's just trying to be practical. Don't hogtie us, we've got work to do—building for defense.

P. S.—Just as we go to press we learn that a 16-man construction advisory committee, made up of general, mechanical and specialty contractors, has had a session with OPS and has come away mighty disappointed and discouraged over the prospects of having construction exempt from CPR 34 or even working out any practical, sensible regulations. General contractors have never conceded—and they probably never will—that they were bound by CPR 34.

How silly can we get? Again, we say, construction prices are well regulated now. Forget it, Mike, and let us get down to the work we're supposed to do.

Rich



BULLDOZERS COME FIRST! And they're going by air into the Labrador iron ore region. International TD14 tractors and Bucyrus-Erie bulldozers and scrapers are cargo on biggest civilian air lift. Mining corporation borrowed this Fairchild Flying Boxcar from

Air Corps for the big lift. One tractor makes a capacity plane load. Tractors travel from Chicago to Montreal by train, by boat to Seven Islands, then by air to final destination. Equipment is only part of airlift job. All supplies and personnel must also be flown in.

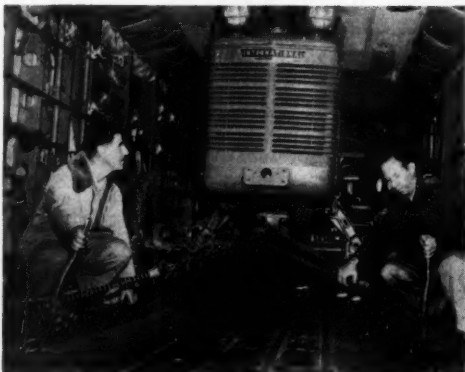
AIR LIFT

Hauls Tractors and Scrapers to Labrador

Pictures and Information from International Harvester Co.



TRACK PLATES must be removed to permit tractors to be fitted into plane. Next step, shown here, is to locate tractor's exact center of gravity by balancing rig on pole to determine proper loading.



WEATHER on the air lift gets pretty rough at times, so tractors are firmly secured by steamboat ratchets inside of big plane. One TD14 tractor, minus treads, makes up a load.

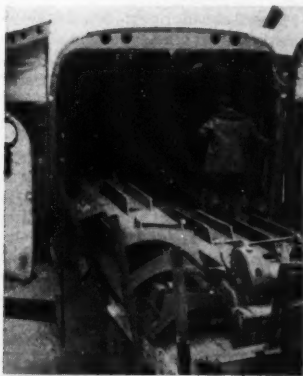


TRACTORS, minus track plates, are loaded on to truck at Seven Islands airport for haul to plane that will take them on 320-mi flight to Knob Lake mining district.

MAN CANNOT OPERATE today without construction, and construction cannot operate without equipment. Therefore, the first step in development of the Labrador iron ore fields was to bring in construction equipment, materials and supplies. And the only way to reach the ore reserves 320 air miles across barren wastes north of Seven Islands on the St. Lawrence is by air. The development is being made by Iron Ore Company of Canada, and for a couple of years now their subsidiary, Hollinger Ungava Transport, Ltd., has been flying men, grub, supplies and light equipment into the Burnt Creek area. At first only small bush planes, equipped with skis or pon-



AT END OF FLIGHT at Knob Lake tractors are unloaded from plane on to trailer, then rolled to ground over timber cribbing. Air trip from Seven Islands takes less than 2 hr.



BULLDOZER BLADES, Carco tractor winches and assorted spare parts make up separate loads for the Flying Boxcar. These were flown in after tractors and scrapers were loaded.



TRACK PLATES are flown to Knob Lake by DC3 cargo plane. This is a summer scene at the mining region after heavy snow fall that occurred June 7.



SCRAPERS, too, make the trip to Knob Lake by air. Here is an 8-yd Bucyrus-Erie rig rolling up the ramp into the big plane. One scraper is a plane load.



DAY AFTER tractor and scraper land at Knob Lake they are at work digging gravel for roads and railroad subgrade. Some of the machines have already been sent overland to Lake Manihet, 20 mi to south to start earth-dam hydro project.

toons, depending upon the season, could be used. Eventually, an unpaved air strip near Knob Lake, about 8 mi from Burnt Creek, was completed to allow larger planes to land, and the old reliable DC3's were put into service.

The air lift reached a climax in June when 15 International TD-14A diesel tractors were flown in one at a time in a Fairchild C119, Flying Boxcar borrowed from the U. S. Air Corps. This plane, capable of carrying 16,000 lb live load, was just about loaded to capacity by each tractor. The track plates had to be removed, otherwise the rigs would have been too wide for the plane. Bulldozer blades and tractor winches made up separate loads.

Bucyrus-Erie 8-yd scrapers were also loaded on to the plane for the air trip, with only an inch to spare on each side. Track plates were flown in at the same time in DC3's.

Cost Runs High

Cost of the air lift runs from 8 to 10c. per lb. These high rates are acceptable in view of 417 million tons of high grade ore already proved in the Burnt Creek-Knob Lake areas. This project is really big business, for it is estimated \$200,000,000 must be spent before the first ton of ore is delivered to a boat at Seven Islands.

The accompanying pictures show highlights of the tractor-scraper air lift.

Progress of the Development to Date



BURNT CREEK CAMP on a June day. Despite late snows, camp is comfortable with log and steel buildings, running water, modern plumbing, and electric lights from diesel generator. This camp, now headquarters, will be replaced by permanent town at Knob Lake.

The Labrador iron ore development project starts at the old Hudson Bay post and fishing village of Seven Islands on the north shore of the lower St. Lawrence beyond rail and highway access. Here is the southern terminal of the 350-mi railroad being built to the ore fields at Knob Lake and Burnt Creek. Here also will be the railroad yards, docks and ship-loading facilities necessary to transfer the ore from rail to boat. The town at present has no water, sewerage or laundry services—it resembles a gold mining boom camp, but it does have a good airport. A diesel generator now supplies the town with limited power. An earth-dam hydro project rated at 30,000 hp will be built on the Marguerite River, 15 mi west of town, for the



CRUDE AIR STRIP at bottom of river valley permits air supply of construction crews working on the railroad at M.P. 28. This is no place to land in a fog!

permanent power supply. It is scheduled for completion in 1952.

The standard-gage single-track railroad, to be known as Quebec, North Shore and Labrador RR, will haul all the ore produced at the mines to tidewater at Seven Islands at the expected rate of 50,000 tons daily with diesel electric motive power. The line is now under construction from Seven Islands (M.P.) to M.P. 75; from Wacouana (M.P. 97) north to M.P. 125 and south to M.P. 90; and from Knob Lake (M.P. 350) south to Lake Menihek (M.P. 330.) Both the Wacouana and Knob Lake operations are supported entirely by air lift. Passing tracks are to be placed every 30 mi. The only tunnel on the line, a 2,250-ft bore at M.P. 11.5, is now being driven. Two major bridges will be built, one across the Moisie River at M.P. 12, the other across the Hamilton at M.P. 328. Spurs will be built out to various mine fields from the collecting yards at Knob Lake. Ruling

grades are 0.3% southbound (loaded) and 1.8% northbound (empty). Maximum elevation of the line is 2,050 ft above sea level.

The mines, all of the open-pit variety with an average overburden of 8 ft, will be in the Burnt Creek-Knob Lake areas. The country is largely barren wastes (55 deg lat) supporting only scrub brush and small, slow-growing trees that furnish a scanty timber supply for both fuel and construction. Winters are severe; temperatures drop to 59 below, and snowfall is heavy, 41 in. last winter. The mines can be operated at best only 6 to 7 months per year. While the rail spurs will run to each mine, excavated ore will first be loaded on to trucks or wagons for haul to the rail heads, and belt conveyors are also a possibility here.

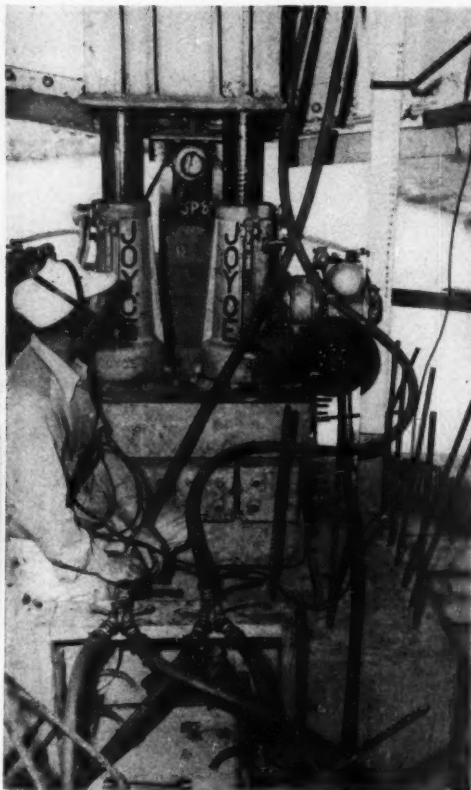
A camp has been established at Burnt Creek, consisting of both log and steel buildings, supported entirely by air lift. So far the only fuel available has been the scrub

timber, not a satisfactory or very lasting source. A permanent town will be built at Knob Lake. Power for the mines and town, including electric heating, will be produced by an earth-dam hydro project at Lake Menihek, 20 mi to the south. The railroad is now being pushed between these two points.

Burnt Creek has a dependable water supply from the stream of that name, and excellent sewerage facilities. A well-equipped repair shop has already been set up to take care of construction equipment.

Despite the abundance of glacial gravel, concrete aggregates are scarce in the area because of the high iron content of the material. Concrete floors in temporary buildings at Burnt Creek, made with this local aggregate, are already going to pieces. Structural concrete simply cannot be made out of this aggregate.

Harry H. Gardner is in general charge of operations for Iron Ore Company of Canada.



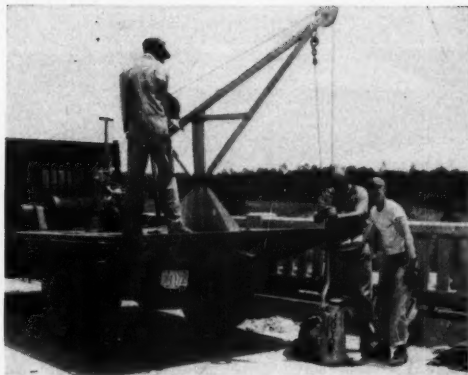
SAVANNAH RIVER BRIDGE
1500 FEET LONG
WEIGHT 4000 TONS
BEING RAISED 17 FEET
BY
E.W. LA PLANTE CO. INDIANAPOLIS, IND.
FOR CORNELL-YOUNG CO. MACON, GA.
SORRY TO INCONVENIENCE YOU

. . . And It Was a
Clever Job
With Air Jacks



ON ITS WAY 17 ft skyward. This 1,500-ft bridge over Savannah River is lifted in 30-in. lifts to clear new Clark Hill Reservoir. Each of four continuous girder sections is raised one at a time, never

more than one lift apart so traffic can be maintained. In this view all four sections have been raised to same level. 500-ft compressor on roadway furnished power to all jacks.



AIR JACKS are lowered to position on top of piers through holes cut in deck slab. That's Kenneth F. Adair, La Plante president and general manager, behind the dark glasses.

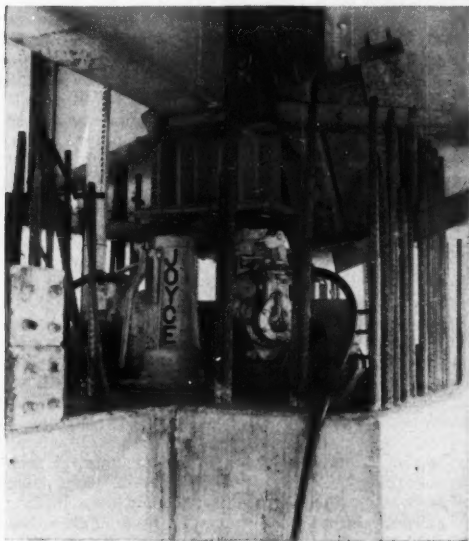


INGENUITY RAN RIOT on a bridge raising job across the Savannah River where four sections of continuous deck girder spans totaling 1,500 ft long and weighing 4,000 tons, were raised 17 ft by a clever arrangement of air jacks—and traffic was maintained all the time except during actual lifting operations. E. W. La Plante Co., veteran moving contractors of Indianapolis, did the raising for Cornell-Young Co., Macon, Ga., general contractors for the whole job. The Joyce-Cridland Co. who supplied the air jacks and helped plan the operations, says this was the toughest project they have seen in their 68 yrs of experience.

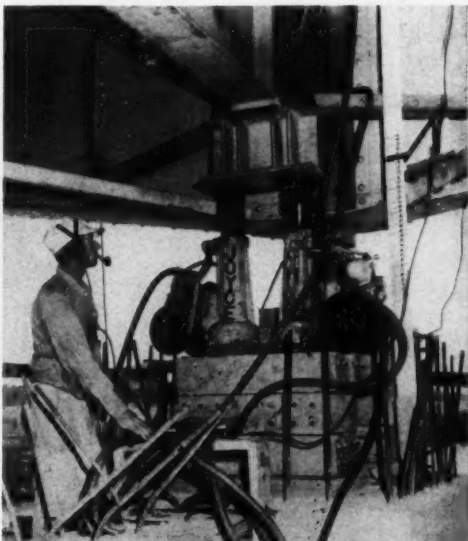
The bridge, spanning the river between Lincoln-ton, Ga., and McCormick, S. C., was built in 1937 by

the Georgia Highway Dept. in line with the policy of the two states by which they each build and maintain alternate interstate structures. The bridge was built high enough to clear the Clark Hill reservoir then proposed, but never built, by the Georgia Power Co. When the Corps of Engineers designed the Clark Hill Dam now under construction, the crest was raised 17 ft above former proposed height. Each of the four continuous girder sections consists of two full spans and two shorter end spans.

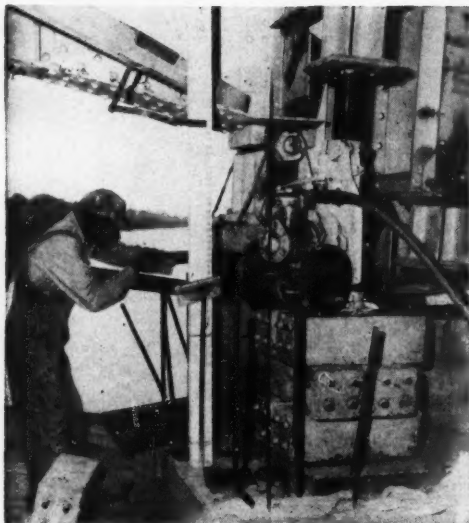
Each continuous section, 375 ft long, was lifted separately as a unit in 7½-in. increments for 30-in. lifts. Thus, there was never more than 30 in. difference in elevation between adjacent sections so traffic



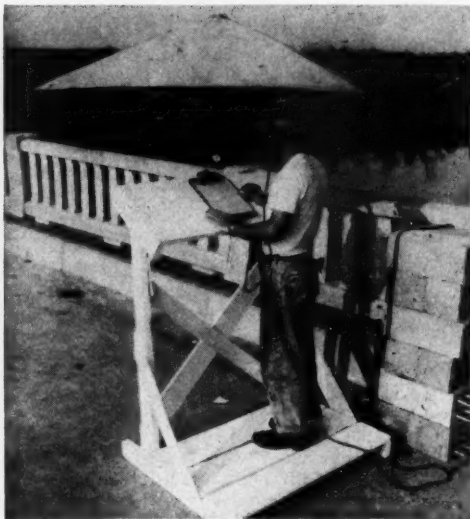
START AND FINISH of a 30-in. lift. Two sets of double 100-ton jacks are used at continuous span piers. Short I-beam, reinforced with ribs, is welded to under side of end beam for jacking pad. Lifts



are made in 7½-in. increments; precast blocks are built up under jacks and span shoes between jack runs. Gage boards measure lift progress. Jack operator receives instructions by phone.



STEEL SHIMS are placed under span shoes as safety precaution during jack runs, replaced by blocks at end of run. This is view of one of short span piers, where only single 50-ton jacks at each end of pier are required.



INSTRUCTIONS for simultaneous jacking and synchronization of all 16 jacks are given by control man at control station through two-way telephones. Jacks start 1/2-in. lift at his signal. All stations report in before next signal is given.

could be maintained over timber ramps. An approach system resembling that on military pontoon bridges—hinged ramps supported by adjustable trestles—took care of traffic at the bridge ends. Because contractor's equipment on the bridge closed one lane, all temporary ramps were single lane only. One-way traffic was controlled by signal lights at each approach, operated 24 hr per day by a patrol-

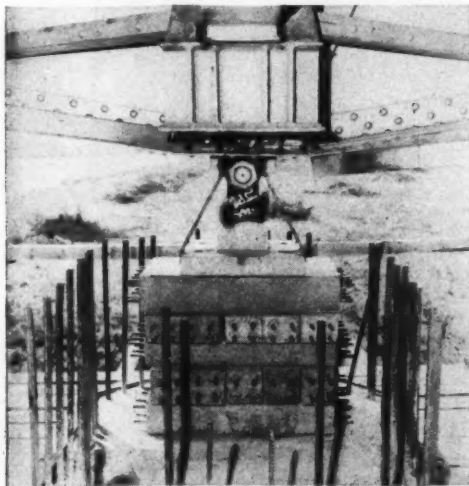
man operating switches at the center of bridge.

I-beam jacking pads were welded to the under side of the end transverse beams of each span. These were placed as close to the girder shoes as possible so the jacks could set on the same piers as shoes. Jacking blocks, 7 1/2 in. square and in various lengths, were precast from 5,000-lb concrete, reinforced with four straight bars. These blocks served two purposes: they were built up under the shoes as the spans were lifted, and they were also built up under the jacks for each increment of lift.

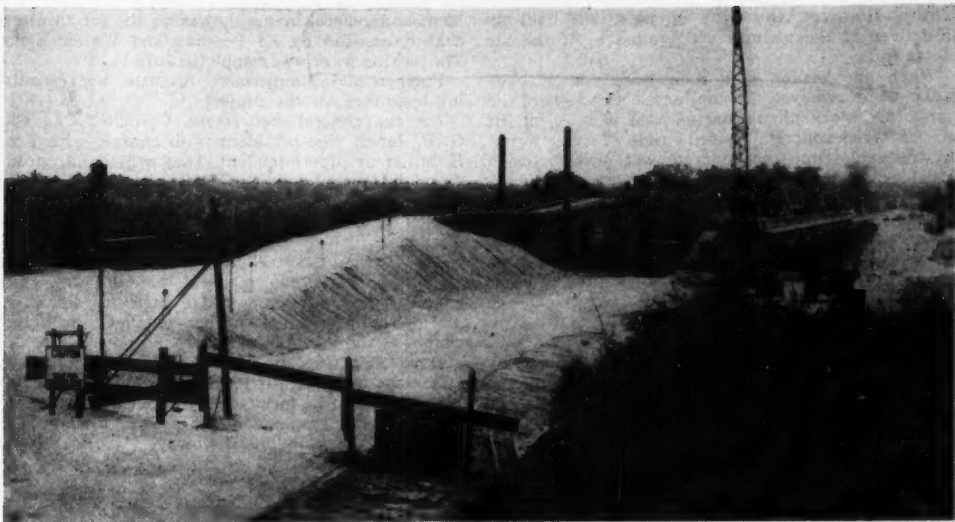
Each jacking set-up for lifting a section required 16 Joyce-Cridland air jacks, powered by Ingersoll-Rand air motors. A pair of 100-ton jacks was placed at each end of piers supporting continuous spans; single 50-ton jacks were spotted at each end of piers carrying the outer end of the short spans.

Jacks were lowered by truck crane into place at top of piers through holes cut in the concrete deck slab. The flared top of jack cylinder was slipped into clip plates bolted to bottom of jack pads. These held the jacks in place, and when they were retracted, the bottom raised up instead of top coming down, making it easy to slip another jacking block into place. One 500-ft Worthington compressor furnished air to all the jacks through a 1,500-ft length of 4-in. pipe laid along the roadway deck. This pipe also served as an air reservoir. The jacks worked under 90-lb air pressure.

Lifts were made 1/2 in. at a time, all jacks acting in unison. Jacks were operated by one man at each pier working two air valves. Where the jacks were in pairs, they were served by two air lines leading off a Siamese connection controlled by a single valve. All jacking operations were synchronized by a control man on deck (off the spans being raised) who was in constant touch with each jack operator through two-way headset telephones. Jack operators could



ALL SET for encasement in 30-in. lift of concrete is this blocking under one of span shoes. Lower part of shoes is welded to upper part so both sections will ride up with span. Jack pad is at top.



TRAFFIC IS MAINTAINED over hinged timber ramps at approaches supported by adjustable trestles. All traffic is single lane because of equipment occupying half of bridge roadway. It is controlled by signal lights at each end, manually operated from center of

bridge. Traffic is held up from 25 to 30 min or more during each $7\frac{1}{2}$ -in. jack lift, but delays are preferred by traveling public to the alternate of driving 35 to 40 mi to next bridges upstream and down.

check the progress of each move by gage boards set up at the jacking stations.

Each 30-in. lift was made in increments of $7\frac{1}{2}$ -in. jack runs. Each run was just high enough to permit slipping another row of concrete blocks, arranged in cribbing fashion, under the span shoes, topped by a sheet of lead as a temporary bearing plate. Then the jacks were retracted, throwing the

weight on to the shoes. Since top of jack was clamped to the jacking pad, the bottoms of the jacks moved upward when retracted. This allowed space for setting new blocks under the jacks, and the lifting process was then repeated until a 30-in. total lift had been made. As a precaution, during the lifts, the span shoes were followed up with a series of $\frac{1}{4}$ -in. steel shims to hold the load in case of jack



CROSSING from section to section of bridge at different levels—never more than 30 in. apart—is made by hinged ramps. Finger expansion joints often cause trouble in bringing sections to same

level again. Sometimes it is necessary to shift spans laterally short distance by unequal lifts to make teeth mesh. By juggling the jacks, spans could be rocked like a cradle.

failure. However, this type of jack will hold its load even if the airlines are broken or if the air motor fails.

When one section had been raised 30 in., the jacks were removed to another section. Then the temporary block piers were encased in a 30-in. lift of reinforced concrete poured inside of steel forms. At the same time the concrete web wall between pier legs was built up 30 in. Working scaffolds, hanging from the spans, rode up with each lift.

It usually took from 25 to 30 min for a jack run, with most of the time taken up in blocking up. Traffic was held up during these times, and if it was piling up, it was allowed to clear before another run was made.

The highway department had three surveyors on hand with transits to constantly check line and grade during a lift. Wind velocities were checked by anemometer, and no jacking was done when the wind exceeded 15 mph.

The E. W. La Plante Co. used only 16 men on the jacking operations: 5 on the jacks, one control man, 7 laborers and 3 supervisors. Kenneth F. Adair, pres-

ident and general manager, was on the job in direct charge, assisted by Ed Peschau and Walter Elery. The jacking work was completed July 13.

Patchen and Zimmerman, Augusta, are consulting engineers for the project.

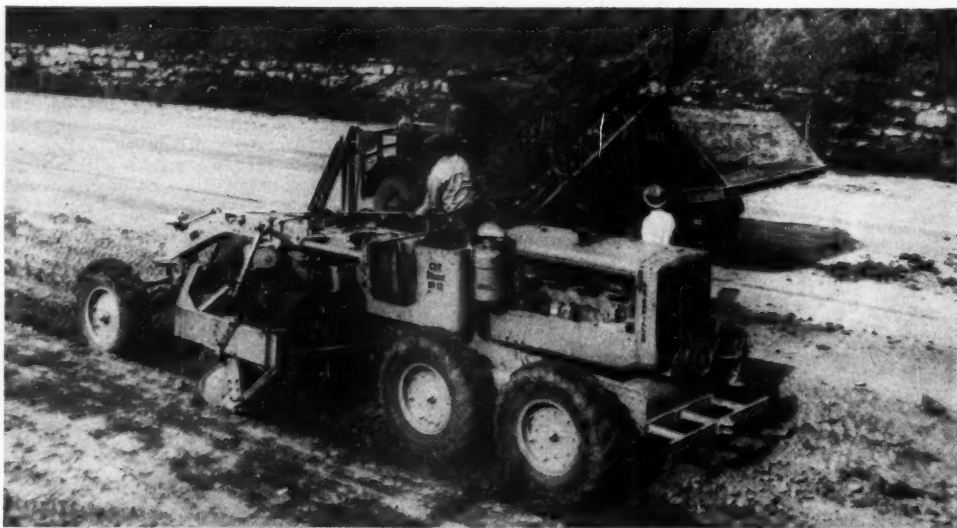
For the general contractors, Cornell-Young Co., G. P. Jones, vice-president is in charge, with Fred B. Miller as superintendent. They will build an additional approach span and new abutments at each end. R. A. Bowen Co., Macon, Ga., is doing the approach grading with Harrison Knowles as superintendent.

The Georgia State Highway Dept. is represented by Jim L. Gillis, chairman; M. L. Shadburn, chief engineer; C. N. Crocker, bridge engineer; and C. A. Marmelstein, assistant bridge engineer in actual charge at the job.

Dave Stockman, of Joyce-Cridland Co., Dayton, Ohio, who made the air jacks, was present as technical adviser for the jacking. He supplied the information and photographs for this article. The pictures were taken by Ralph Holloway, Augusta (Ga.) Herald.

Small Elevating Grader Cuts Road Widening Trench

By RED DUNCAN, John Fabick Tractor Co., St. Louis, Mo.



IN ADDING a fourth lane to busy three-lane Rt 66 Bypass west of St. Louis, Fred Weber Contractor, Inc., dug the 12-ft wide trench out of the hard-packed shoulder in fast time with a Domar elevating grader. This clever attachment for a Caterpillar 12 motor grader dug and loaded material out of the trench at the rate of more than 400 yd per hr, filling 5-yd trucks in 30 sec.

As can be seen from the above picture, the elevating grader moved down the shoulder, widening the cut a slice at a time, while loading into trucks rolling on the outside paved lane. Highway traffic wasn't bothered too much. The rig left the trench remarkably clean. All that was left for a motor grader to do was to cut out the narrow strip alongside the old slab, which the elevating grader couldn't get to,

and spread this excavated material over the bottom as a leveling course, blading out any surplus onto the new shoulder. One pass of the grader did the trick.

The Domar elevating grader attachment is made by Ulrich Products Corp., Roanoke, Ill. The loading belt is driven through a power takeoff from the motor grader engine. One operator runs the whole works.



SOME 500 HOLES, 5 ft dia and 6 ft deep, were drilled by this special Williams power auger for Ford plant foundations at Kansas City. Gas-engine driving rig with positioning movements hydraulically controlled, is on International truck equipped with outriggers.



TO DISCHARGE auger load, bit is raised to surface and spinning is reversed. Centrifugal force throws material clear of hole.

Big Power Auger Drills Footing Holes for Ford Plant



ANOTHER HOLE DONE, let's go to take next one. Truck outriggers are retracted, boom is lowered by hydraulic ram, raising auger in clear at same time, for travel.

IN DRILLING some 500 holes for circular footings 5 ft dia and 6 ft deep for the new Ford Motor Co. assembly plant near Kansas City, Mo., Long Construction Co. of Kansas City report considerable cost savings with a big truck-mounted power auger. The machine put down from 6 to 7 holes per hr.

The power auger was built for Long by Hugh B. Williams Mfg. Co., Dallas, Tex. Mounted on an Army surplus 6x6 International truck, the rig is powered by a Waukesha 190GK engine. The unit revolves on a hydraulic-powered turntable for positioning the auger any place in a 180-deg swing around the truck bed. A hydraulic retracting system gives a 24-in. radial leeway in spotting the auger. Hydraulic rams also lift the boom into drilling position from its horizontal traveling position. The auger bit is raised by cables.

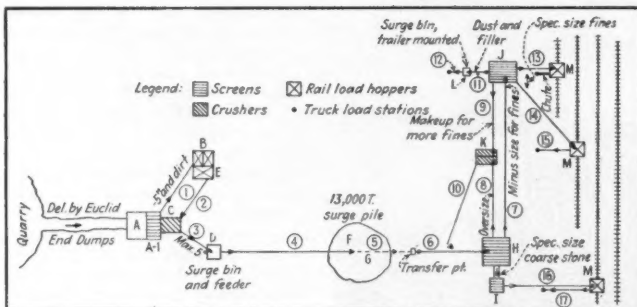
Hydraulic outriggers stabilize the truck during drilling operations. Holes up to 25 ft deep can be drilled with a 5-ft auger. Long had used this same rig previously in drilling 93 foundation holes 3½ ft dia, 10 ft deep in shale, in 2½ days, on a new building for Stern-Slegman-Prins Co. in Kansas City.



QUARRY-RUN MATERIAL is dumped by Euclid truck into receiving hopper (A) for start through New Jersey Turnpike aggregate processing plant. Air hoist on top of dump station handles grappling hook for dislodging big rock. In foreground is grizzly (A-1) that

sends everything over 5 in. to Cedar Rapids double impact breaker (C) alongside, and all else to Iowa and Tyler screening plant (B) and (E) in background.

Portable Unit Aggregate Plant Turns Out 6,000 Tons Daily for Jersey Pike



FLOW DIAGRAM of simple but highly efficient plant turning out 4,000 tons asphalt paving aggregate daily for New Jersey Turnpike.

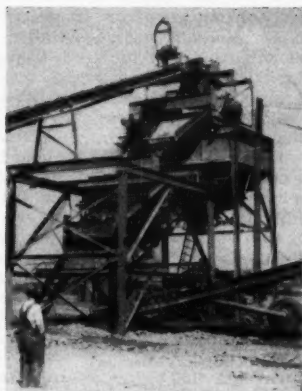
- A. Receiving hopper for quarry run material.
A-1. Grizzly.
B. Cedar Rapids 4x12 wash screens separating quarry fines and dirt from coarser stone.
C. Cedar Rapids Double-Impact Breaker reducing oversize to 5 in.
D. Surge bin and feeder to main belt.
E. Tyler Niagara 6x14 double deck screen for further separating of coarser stone.
F. 13,000-ton raw material surge pile.
G. Armac 8-ft tunnel with two 36-in. feeders.
H. 3 Tyler Tyrock 4x12 screens for sizing coarse stone. Oversize goes to crusher K; minus to

- screen plant J; spec size coarse to wash screens I.
I. Cedar Rapids 4x12 wash screens for final preparation spec size coarse.
J. Cedar Rapids screens for processing fines. Deficiency in fines can be made up by routing coarser sizes back through crusher K for further reduction.
K. Cedar Rapids and one Williams 40-in. hammer mills.
L. Dust and filler surge bin on trailer.
M. Rail loading bins; also feed truck loading conveyors and chutes.

NOTE: Letters in parentheses in text and photo captions refer to features shown in accompanying flow sheet.

SPECIFICATIONS for asphaltic concrete aggregate for the New Jersey Turnpike paving are tough, calling for 7 sizes of crushed rock from asphaltic concrete stone to 3-in. base rock. Yet Concrete Materials & Construction Co. is meeting these specs without batting an eyelash, turning out 6,000 tons daily in a beautiful plant made up mostly of portable units near West Chester, Pa. This firm, specializing in aggregate production all over the Western Hemisphere and headed by the indomitable Sid Moore, hails from Cedar Rapids, Iowa.

They are furnishing some 750,000 tons of paving aggregate for Savin Construction Corp. and S. J. Groves & Sons on two contracts for the turnpike totaling 38 mi of 4-lane route. A limestone quarry was opened up alongside a com-



DIRT AND DUST are screened out of minus 5-in. material in this Iowa and Tyler Niagara screening plant (**B** and **E**).



SURGE BIN with feeder (**D**) at right evens flow from crusher-run belt to main stacker belt to surge pile (**F**). In background, from left to right, are screen plant (**J**), hammermills (**K**), screen and wash plants (**H**) and (**I**), and one of three rail-truck loading bins (**M**).

mercial plant outside of West Chester, and facilities were set up for both rail and truck haul to the jobs 35 to 60 mi away.

The quarry is drilled vertically 55 to 60 ft by two Bucyrus-Erie 29T and one Cyclone Clipper 9-in. well-drills, and one Joy 6¼-in. blast-hole drill. Atlas Giant gelatin, 60 and 75%, in 5½- and 8-in. cartridges is fired by the Atlas Rockmaster system, resulting in exceptionally good breakage. Rock is loaded by a Lima 1201 3½-yd shovel and Northwest #6 shovel into six Euclid end-dumps for a short haul to the primary crusher.

The accompanying flow sheet shows the layout of the crushing and screening equipment. After the raw material, 5 in. max size, leaves the surge pile (**F**) it can be circulated through two screening and three hammermill stations to produce any proportion of any size material desired. This is really a most flexible plant.

Quarry run material is dumped into a receiving hopper (**A**) and the minus 5-in. material then goes through a grizzly to a set of Cedar Rapids scalping screens (**B**). The quarry fines and dirt are screened out at the scalpers and the coarser material goes by a chute belt to Tyler Niagara double-deck 6x14 screens (**E**) and thence returned to the primary. Plus 5-in. sizes pass through a Cedar Rapids double impact breaker (**C**) for reduction to 5-in. max size, thence by belt to a surge bin and feeder (**D**) over the main belt to the surge pile (**F**).

Under the surge pile is an Armco 8-ft tunnel (**G**) containing two 36-in. feeders. These load a belt



CONVEYOR FLIGHTS from surge pile (**F**) to central screen plant (**H**) are protected by 8-ft Armco tunnel (**G**) containing two 36-in. feeders.

Conveyor Flights
(All belting Goodyear style B)

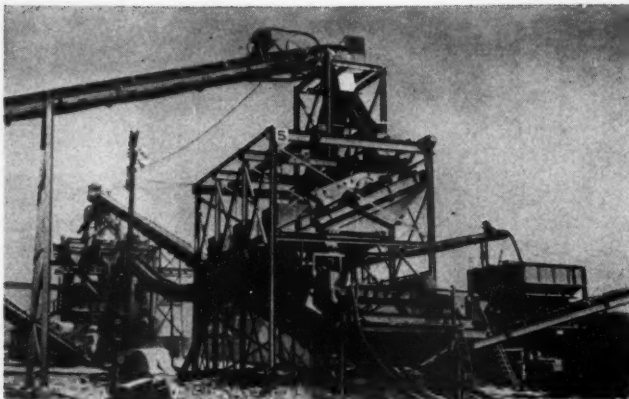
No.	Width	Length	Motor
1	30 in.	95 ft.	Iowa Mfg. Co.
2	24	65	" " "
3	36	88	" " "
4	30	230	" " "
5	30	120	" " "
6	30	120	" " "
7	30	148	25 American
8	24	50	Iowa Mfg. Co.
9	18	56	24 American
10	30	70	Iowa Mfg. Co.
11	30	55	" " "
12	30	35	" " "
13	18	41	24 American
14	18	88	24 American
15	30	45	Iowa Mfg. Co.
16	30	110	" " "
17	30	45	" " "

leading to the central screen station, where the material is sized

by three Tyler Tyrock 4x12 screens (**H**).

Coarse material of specification size can be bypassed from these screens directly to Cedar Rapids 4x12 wash screens (**I**) and thence to a combined truck and rail loading station (**M**). Oversize from the Tyrock screens goes to a hammermill station (**X**) of two 40-in. Cedar Rapids mills and one Williams 40-in. Super Plugger mill for further reduction. Everything from these mills is routed back through the Tyrock screens.

Minus size material from the Tyrock screens is carried by belt to a fine processing plant of three Cedar Rapids (4x12) screen (**J**). Here the asphaltic concrete and penetration choke spec sizes are screened out and go to two rail-

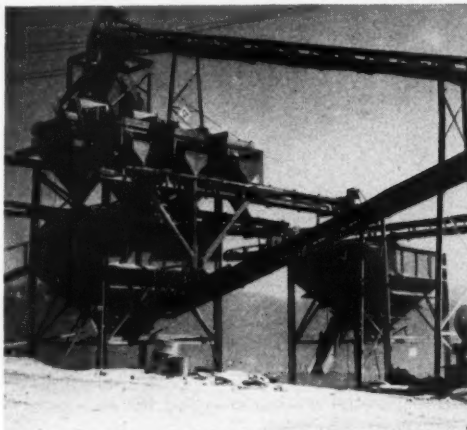


SPECIFICATION COARSE AGGREGATES are sized in this Tyrock screening plant (H), then go to Cedar Rapids wash screens (I) in lower foreground, thence to rail-truck loading bin (M) at extreme right. Minus material takes long belt to screen plant (J); oversize travels swayback route to hammermills (K).

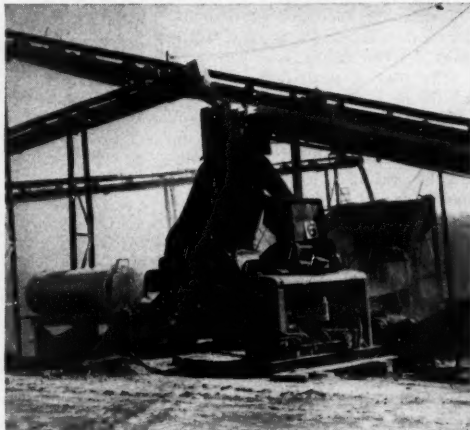
truck loading stations. Dust and filler material is routed to a trailer-mounted bin (L) for truck-loading. If intermediate screen sizes are deficient, the coarse material may be sent back through the hammermills for further pulverization.

Each of the three combined truck-rail loading stations (M) is a bin set over a railroad track. For rail haul the bins discharge directly into gondola cars. From two of the bins a belt delivers material to truck stations; a chute loads trucks at the third station. There are 4,000 ft of railroad tracks in the yard. Cars are switched by 23-ton G.E. locomotive.

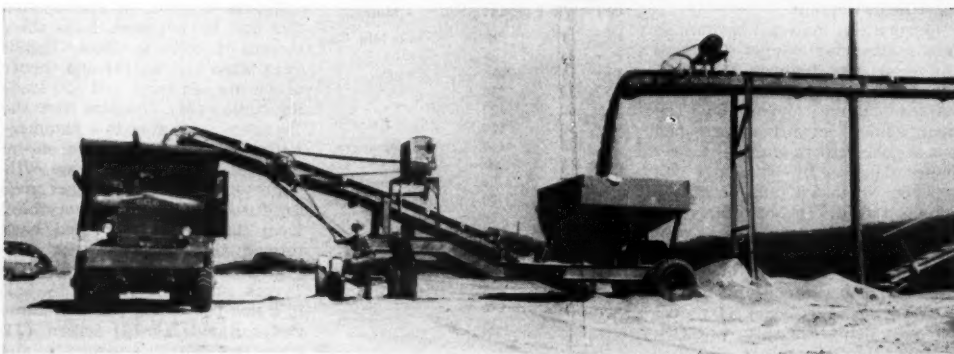
Because the paving contractors can't absorb the materials as fast as they are produced in the early stages of the paving program, considerable stockpiling is necessary at the plant. Koehring Dumptrons



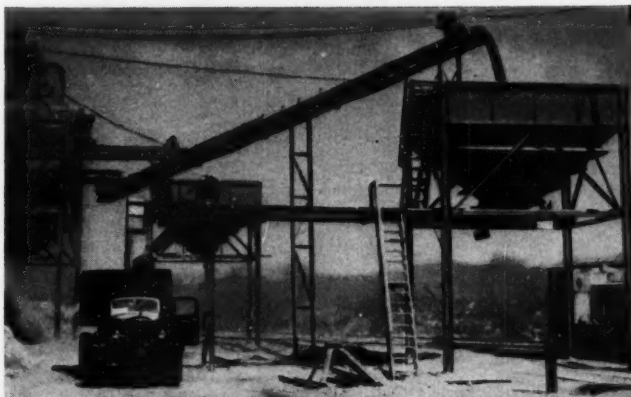
FINES ARE PROCESSED in this triple Cedar Rapids screening plant (J). Spec size fines go to loading bins (M) in center background or to filler material bin (L) out of sight at left.



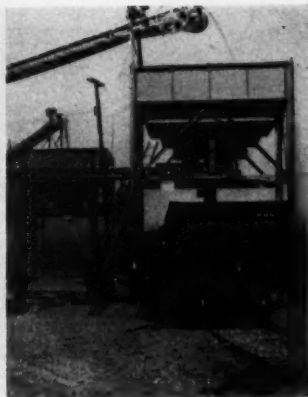
OVERSIZE from primary crusher (C) and make-up fines are crushed in these three Cedar Rapids and Williams hammermills (K) driven by Murphy ME66 diesel.



EXTREME FINES and waste material from screen plant (J) are loaded out through this trailer-mounted bin (L). Trailer also supports gas engine driven discharge conveyor.



CLEVERLY ARRANGED loading bins (M) are equipped to discharge into trucks (left) or railroad cars (right). Two of three bins load trucks by belt, the third by a chute.



haul the rock from loading bins to the various stockpiles where it is built up, and eventually loaded

out, by a Northwest Model 6 clamshell. An A-C HD19 bulldozer keeps the stockpiles trimmed.

Dean Curphy is superintendent at the plant for Concrete Materials & Construction Co.

Wood Piles Encased in Shotcrete for Teredo Control

MARINE BORERS damaged the wood piling on the Seaboard Air Line R.R. trestle across Gasparilla Sound in Florida so badly they had to be replaced. The railroad's engineering department worked out a procedure for encasing the new piles with 1½ in. of Shotcrete from 18 in. below mudline to high waterline before driving for teredo control. Test piles driven at various location determined these limits within four range groups.

The piles, laid out on stringers, were drilled with 4-in. augers ½ in. deep to form key bond holes. Wire mesh was wrapped around the piles, held ¾ in. from the surface by special-driven chais. Heavy rope wrapping formed end bulkheads.

Shotcrete was applied to a uniform thickness of 1½ in. as the piles were rolled over. The encasement was cured under wet burlap. Only trouble from driving was in a few cases where the Shotcrete had not been allowed to cure a full 7 days. The job was done by railroad forces under the direction of J. R. Traphoner, division engineer, with L. M. Harpley, master carpenter, in charge.—Information and pictures from Portland Cement Association's *Concrete for Railways*, Vol. 14, No. 2.



SHOTCRETE is applied to wood piles as encasement protection against marine borers on Seaboard Air Line trestle. Encasing mortar is applied from top as pile is rolled along stringers on ground.



WIRE MESH is wrapped around piles, held by driven chair anchors, before Shotcrete is applied. Heavy rope serves as end bulkheads. Encasement is placed over pile length from 18 in. below mudline to high water level.



FIRST BUILDING at Paducah atomic energy plant gets under way amid usual confusion of starting a big job. Project will run about half a billion dollars in construction costs.

Kentucky AEC Plant Organized for Fast Job

HERE'S WHERE we came in ten years ago. The same hectic organized confusion, the same jamming up of personnel in temporary, inadequate working spaces, the same mud and dust, the same rush of carpentry on warehouses and office space, the same pouring in of materials and equipment by the hundreds of carloads, the same frustrating attempts to build roads and railroads and to get the job started with whatever equipment was available at the start.

Ten years ago it was a big air-base, cantonment or ordnance plant. Today it is the big Atomic

Energy Commission's new Kentucky Area Plant 16 mi west of Paducah. When AEC announced the construction award last December for \$350,000,000 to F. H. McGraw & Co., Hartford, Conn., it was regarded as the largest single contract ever let. Today they are already talking about a half-billion-dollar job.

The Kentucky plant will produce fissionable uranium-235 by the gaseous diffusion process. It occupies a tract of 5,000 acres straddling the abandoned Kentucky Ordnance Works whose equipment is being dismantled and shipped

elsewhere. Some of the old buildings are being retained for contractor shops and offices. Also, the old plant offers the nucleus of sewerage and water supply systems.

The site lies in the Ohio River flood plain. Alluvial muck and silt 18 to 30 in. deep covers a hard clay. This silt is mean to handle when wet—and it has been an exceptionally wet spring in the lower Ohio Valley. All the soft material must be stripped from building sites, and from road and railroad locations, to be disposed of in some cases by a 2-mi haul. Shovels, ditches and draglines often must work on mats.

The job is on a tight schedule. Work started shortly after the first of this year. Peak construction manpower will top 12,000 by next December.

The Atomic Energy Commission negotiated the construction con-



GRADALL DIGS rough column pedestal pits (above), followed by trimming up with clay spades (right).



AS PROJECT LIES in swampy Ohio River flood plain, one of first construction jobs is to open up drainage ditches. Lima dragline

(left) working off mats digs main ditch, while Hyster tractor dragline (right) opens up a lateral.

tract with F. H. McGraw & Co. on a fixed-fee basis and assigned Kenneth A. Dunbar and E. A. Wende as manager and deputy manager, respectively, in charge at the site. Carbide and Carbon Chemicals Division who will operate the plant, is responsible for process design and procurement of special and critical materials. Giffels & Vallet, Inc., Detroit; Smith, Hinchman & Grylls, Inc., Detroit; and Sargent & Lundy, Chicago, are consulting engineers on the project.

According to AEC, F. H. McGraw & Co. was selected because: "At the time this company was immediately available, and had the organization, background and experience necessary to carry out a project of this magnitude in the time required." The contractor's first task, of course, was to organize the job.

Clifford S. Strike, president of the McGraw company, designated



WAREHOUSES, as usual, are one of contractor's early requirements. Here is a big one being floored, with columns and trusses in foreground ready for erection.



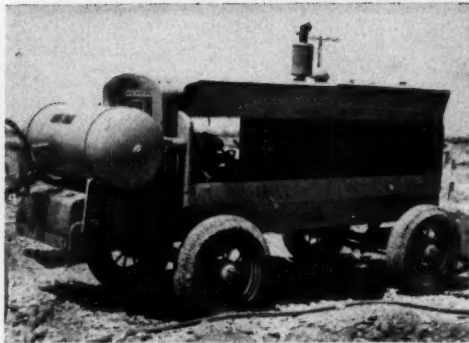
FOOTING is poured from transit mixer backed up to hole.



SCRAPERS (above) and shovel strip silt from building sites.



PORTABLE COMPRESSORS power clay spades and vibrators on footing construction. At left is Ingersoll-Rand new 600-ft rotary;



at right is 500-ft LeRoi, typical of portable compressor installations scattered throughout the building sites.



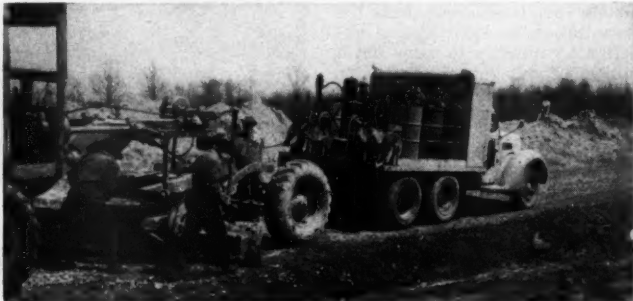
TEMPORARY RAILROAD CONSTRUCTION is a real job, involving bridge construction of 7 culverts encased in concrete (left), and compacted fill (right) made up of clay and gravel scooped up from



roadside borrow pits. Railroad spurs had high priority on construction schedule, for they were vital to concrete plants and warehouses.



FIELD SERVICING of heavy equipment is by special compressed-air powered lube truck designed and built by contractor. Truck services are supplemented by hand grease guns (right).



Don Neville, vice-president at Chicago, to start the project, and A. A. (Whitey) Persson was named temporary project manager with C. A. Billings as assistant, and R. Burroughs as administrative assistant. Later Frederick J. Mayo, vice-president for the McGraw company, took over as resident

officer and project manager. Under this top staff five departments were organized as follows:

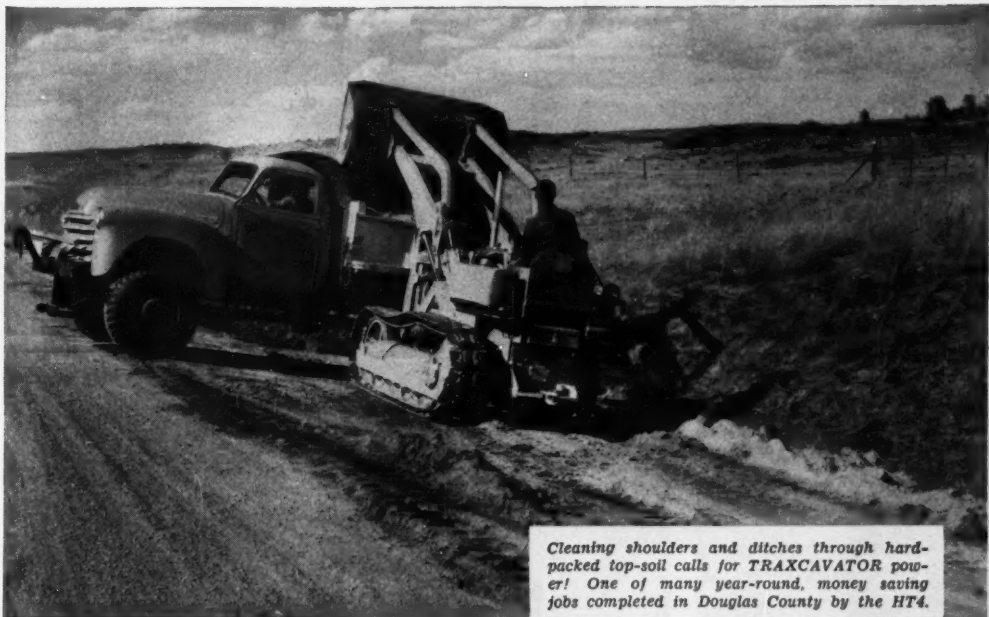
- **General Construction**—Jack M. Curlee, general superintendent. There are two assistant general superintendents on structural and mechanical work, and the following division construction superin-

tendents in charge of operations in the field:

Iron Work; Carpenter; Labor; Concrete; Masonry; Painting; Equipment; Excavation; Piping; Electrical; Millwright; Sheet Metal.

Also there are six area superintendents in charge of one or more buildings and plants. The chief of

(Continued on page 58)



Cleaning shoulders and ditches through hard-packed top-soil calls for TRAXCAVATOR power! One of many year-round, money saving jobs completed in Douglas County by the HT4.

YOU NAME IT **A TRAXCAVATOR** WILL DO IT!

Whatever your job, digging, loading, grading, 'dozing, excavating, stripping, backfilling, land-clearing, ditching, snow-removal—whatever the material—a TRAXCAVATOR will do it . . . faster and cheaper.

Douglas County, Colorado, uses their versatile HT4 TRAXCAVATOR to clean shoulders and ditches, feed sand and gravel to a screening plant as well as many other jobs throughout the county.

Converting dependable "Cat" Diesel Tractor power to work-power, these economical and rugged tractor-shovel teammates are designed to meet any task. Powerful digging action gets heaped loads every pass . . . balanced design . . . wide tracks allow high gear hauls . . . positive dumping gets all the material out of the bucket . . . high lift gets the load into any hauling unit. And the rear of the tractor is free for drawbar work or installation of other equipment.

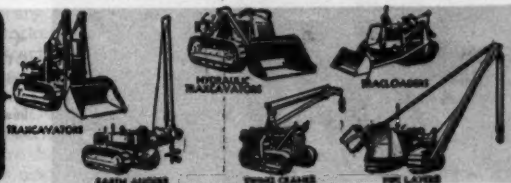
There are five TRAXCAVATOR models with capacities from $\frac{1}{2}$ to 4 cubic yards . . . with a full line of attachments to increase job range! See your TRACKSON—"Caterpillar" Dealer or write TRACKSON COMPANY, Dept. CM-81, Milwaukee 1, Wisconsin.

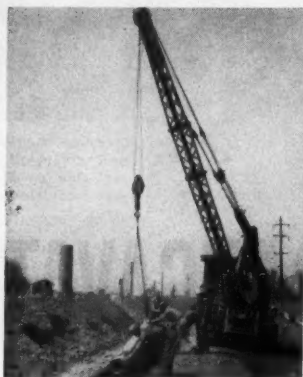


Digging and feeding pit-run gravel to the screen hopper, this hydraulically controlled HT4 TRAXCAVATOR handles over 500 cubic yards a day for Douglas County, Colorado.

TRACKSON

TRACTOR EQUIPMENT





UTILITIES, such as water lines, are first priority on big job. Here is a Parsons trencher (top) digging out a deep trench, cutting bell holes (bottom, left) as it goes along, while Hyster crane lays pipe (bottom, right) behind ditcher.



ALL SET for warehouse truss erection is this Bucyrus-Erie 22-B truck crane with boom length of 70 ft plus 20-ft jib.



TROUBLE! Equipment must work on mats in silt area, and occasionally a unit slips off mat and bogs down, just as this B-E backhoe did.

←
OTHER DITCHES are dug with Bucyrus-Erie 10-B backhoe working through silt overburden.

railroad traffic is also assigned to the construction department.

• **Engineering Department**—L. H. Harmon, project engineer. Under him is a division engineer, and two assistant project engineers in charge of field and office work. The contractor must do all of his own

Key Personnel at Paducah AEC Plant



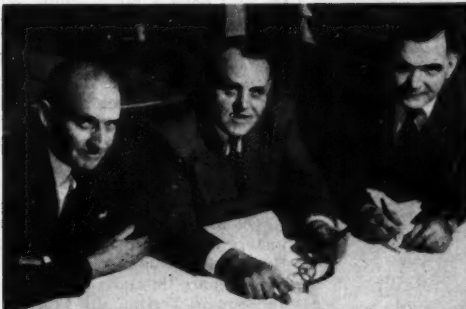
KENNETH A. DUNBAR
Project Manager for AEC



CLIFFORD S. STRIKE
President, F. H. McGraw & Co.



FREDERICK J. MAYO
McGraw V.P., Project Manager



BYRON NIELSON (center) in charge of industrial relations, is surrounded by Herman Root (left), director of purchasing; and Bruce Wild, traffic manager (right).



JOHN GALLEY (left), who will have charge of vital piping installation, talks it over with Jack Curlee, boss of construction operations. This team came up from Coosa River paper mill job.

surveying and layout, so the engineering department is unusually large. A chief engineer is assigned to each of the following:

Subcontracts; Costs; Office; Drafting room; Mechanical; Electrical Structural; Piping; Civil; Materials; Job Engineer; Field Engineer (Surveying).

• **Industrial Relations**—Byron H. Nielson is director; J. Woolridge is administrative assistant. Under them are an assistant director, a safety engineer and the following managers:

Personnel; Labor Relations; Personnel Services; Plant Protection.

• **Accounting**—A. F. Furlong is project comptroller. He has an assistant, an administrative assistant, and the following chiefs:

I.B.M. Department; Internal Auditor; Accountant; Time Department; Material Unit.

• **Purchasing**—H. R. Root is director of purchasing; R. S. Merritt is administrative assistant; W. C. Auld is purchasing agent, and E. M. Beaman is AEC liaison coordinator.

Under them are two assistant purchasing agents, a chief expediter and a priority supervisor.

The above is the general outline of the contractor organization. Each department is further broken down into subdepartments and subdivisions with responsibilities and chain of command clearly designated.

Housing Very Tight

At first the contractor, AEC forces and the consultants had to occupy old—and inadequate—Kentucky Ordnance Works buildings. By now new administration buildings have been completed. Both AEC and the contractor are co-operating with local private builders in an effort to relieve the terrific housing shortage in the area. Ten temporary barracks for construction workers are being built.

The contractor carpenter shop, machine shop, garage and automotive service station will occupy abandoned KOW plant buildings. But the following new temporary facilities are being built for the contractor's use:

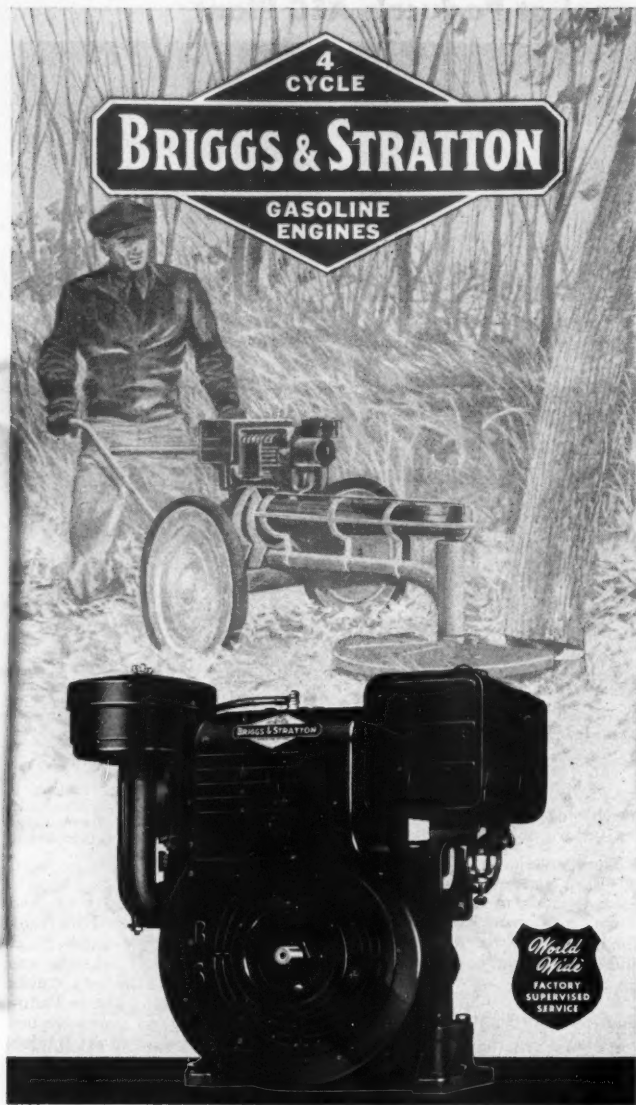
Sand blast shop; Pipe fabrication shop; Electrical warehouse shop and office; Instrument shop; Sheet metal shop; Rigger loft (steel fabrication); Warehouse; Batch plant.

Concrete will be dry-batched and mixed and delivered by transit mixers. Until the batch plant was completed, early concrete was hauled by the contractor's trucks from a commercial plant in Paducah, 16 mi away, an expensive but necessary procedure to get the job started.

First construction operations were clearing, building roads and 4 mi of railroad, and stripping the building sites. For the most part the access roads were laid out on permanent road locations. All permanent roads will be completed this summer to assure construction transportation through the area next winter.

Construction operations under way the latter part of April are shown in the accompanying pictures.

All construction equipment is furnished by AEC. Until new units
(Continued on page 60)



Preferred power on portable power saws — the world's most widely used single-cylinder gasoline engines on hundreds of kinds and types of machines, tools, appliances used by industry, construction, railroads, oil-fields, and on equipment for farms and farm homes.

DEVELOPED through years of building the right power for the toughest service, Briggs & Stratton single-cylinder, 4-cycle, air-cooled gasoline engines assure the best in performance, long life, economy. Briggs & Stratton Corporation, Milwaukee 1, Wisconsin, U. S. A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

could be purchased and delivered, the early equipment roster had to be made up of AEC-owned machines from Oak Ridge and other AEC installations. At first it was a case of taking what was available, but the following equipment list of used and new major units shows a well-balanced spread:

40 dump trucks; 65 stake body trucks; 25 transit mixers; 22 crawler cranes; 6 truck cranes; 4 shovels; 50 tractors; 15 scrapers; 6 graders; 15 bottom-dump wagons.

E. L. Gribble, superintendent of equipment and transportation, is setting up some excellent facilities for taking care of his equipment. He will have a big machine shop for major repairs. Field servicing of heavy equipment is by special lube and service trucks. For automotive equipment he has designed a heavy-duty service station with a pit that will accommodate three trucks at once. Here he has overhead and pit pressure grease and oil lines for quick servicing operations. Also, he has brake testers, wheel aligners and headlight adjusters for big trucks. Two Jenny Hy Pressure steam cleaning units will prepare the units for overhaul and repair. During the first eight weeks 1,600 carloads of equipment and materials were unloaded.

While the labor situation is critical, no serious trouble is expected. Labor is recruited through unions in western Kentucky and southern Indiana. A few inter-union squabbles have popped up, but in general the situation is well under control. Some on-the-job training will be necessary—such as training part of the 500-man welding crew that will be required.

Here are some of the maximum requirements for various tradesmen:

1,050 carpenters; 1,900 electricians; 350 painters; 450 cement finishers; 50 boilermakers; 750 ironworkers; 325 operating engineers; 300 truck drivers; 2,400 laborers; 1,850 pipefitters and plumbers; 550 welders; 300 millwrights-machinists; 175 ma-

sons.

All personnel is checked by FBI for security purposes. Only those with acceptable records will be allowed to work in the highly restricted areas. No persons are allowed within the project area without proper pass and identification credentials.

From all present indications this well-organized and well-run job will roll along to scheduled completion.



"Whatever Your Conveyor Belting Problem . . . Thermoid Has The Answer"

Whatever the job—whatever the nature of the materials to be handled—heavy or light, soft or abrasive, hot or cold, wet or dry, uniform or non-uniform in size—there is a Thermoid belt built to do the job at the lowest cost per ton of material handled.

Thermoid belts are made with an extra margin of endurance. You will find they stay on the job long after ordinary belts fail. With Thermoid, you will have fewer delays due to belt breakage or premature wear. Your Thermoid distributor will be glad to help you with your requirements.

Here's The Book That Will Answer Many Of Your Questions



Drop us a line for your free copy of Book No. 3679. It is a handy reference guide, concise and complete. 16 pages of valuable charts, tables and graphs tell how to select the right conveyor or elevator belt for the materials to be handled... how to determine capacities, speeds, weights and number of plies.

Thermoid

Conveyor & Elevator Belting • Transmission Belting
V.B.P. & Multiple V-Belts • Wrapped & Molded Hoses

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

LA CROSSE DREDGING CORP.

HYDRAULIC DREDGING • GENERAL CONSTRUCTION

310 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS
TELEPHONE HA 7-1484

May 21, 1951

Mr. Larry G. Kelley
Moretrench Corporation
4900 South Austin Avenue
Chicago 38, Illinois

Dear Larry:

Here is a picture of Hutsonville which I thought would be a
dam good advertisement for you - dry hole - river up.

Regards,

Robert Peterson

PCP:EP
Enclosure



Power Plant on the Wabash River at Hutsonville, Illinois

*Thanks Mr. Peterson,
It is!*

Normal water level	444
River stage	447
Caissons' subgrade	433

MATERIAL: Coarse sand, gravel and silt,
with shale rock at subgrade.

For working "in the dry" you
need a MORETRENCH
WELLPOINT SYSTEM.
Contact our nearest office

MORETRENCH CORPORATION

90 West St.
New York 6

4900 S. Austin Ave.
Chicago 38, Illinois

7701 Interbay Blvd.
Tampa 9, Florida

315 W. 25th St.
Houston 8, Texas

Rockaway
New Jersey

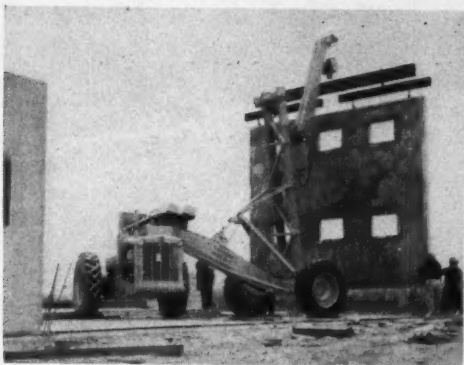
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Tilt-Up Wall Construction Popular in Midwest ... Three Current Examples

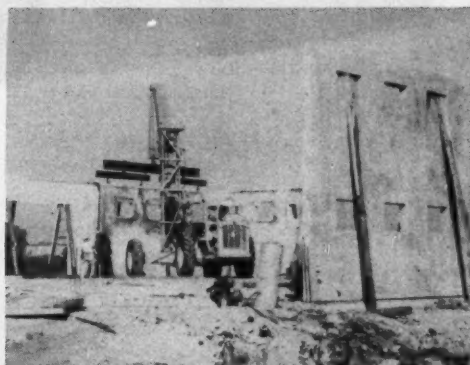
The so-called tilt-up method of building construction—whereby precast concrete wall panels are lifted into place and fastened together by various devices—is not new, but difficulty in handling the panels has held back this economical building process. However, three Midwest con-

tractors have devised somewhat similar, yet different, methods of tilt-up construction on current operations which indicate possibilities of expansion in this type of building construction. We present them here, largely in pictures. —Editor

1. Crane Sets Panels From Inside



AT ADDISON: Tournacrane tilts up high wall panel from within building. Panel is set to check size and location, then is raised as shown here while grout is slushed over wall base.



AT ADDISON: Crane closes in a wall length while previously-set panels are temporarily braced by 4x4-in. rakers. Struts hold panels until columns are poured.

ON A PRECAST WALL BUILDING JOB at Addison, Ill., for the Savogran Co., Bee-Cee Builders, of Skokie, Ill., used an EC-7 Tournacrane for erecting the panels from the inside. Here they first poured the floor slab on the ground, next cast the wall panels on the floor, then picked up the panels for erection with the Tournacrane rolling over the precast slabs on the floor. Details of the operations are shown in the accompanying pictures, also on the front cover of this issue.

The one-story building is designed with poured-in-place floor and footings, precast concrete walls and roof, and a steel frame that takes part of the roof load. Wall panels are joined together by outer all-concrete columns or by concrete-encased steel columns.

(Continued on page 66)



AT ADDISON: Big tires on Tournacrane permit rig to roll over precast panels still lying on floor where they were cast without damage to wall units.

Here's Why **CHARLES**



**See your LeTourneau Distributor
NOW for complete information**

FRYSINGER bought 3 More D TOURNAPULLS



C. W. Fryinger, Columbus, Ohio contractor, bought a high-speed, rubber-tired D Roadster Tournapull especially for finishing sub-grade, berms and back-slopes on a 10-mile, 178,000-yd. stretch of U. S. Hwy. 30N in Crawford and Wyandot Counties. Put to work self-loading around poles and culverts, the versatile Roadster averaged 50 pay yards of topsoil, sand and silt hourly on 1200' one-way hauls through traffic. "It did a first rate job on this assignment," reports Mr. Fryinger.

"In 2005 hours ... 96% efficient

"We purchased our second D Roadster early in 1950, because again we had a lot of berm work," continues the Ohio contractor, who just bought his 3rd and 4th "D's" this spring. "The machines fit right into our program. Our first Tournapull now has 2005 hours on it and is 96% mechanically efficient."

At present, the "D's" are being used by Fryinger Construction Company to handle fine-grading, sloping, and berm construction on 6 miles of State Hwy. 18 between Tiffin and Republic, Ohio. The entire stretch is being widened 6 ft., drain-

age improved, and bad curves corrected. Approximately 58,000 cubic yards are involved. Hauls vary from 300 to 2000 ft. one-way. Here's typical performance:

On 1000' haul ... 54 yds. hourly per unit

Self-loading in topsoil and clay, each 122 h.p. Roadster heaps 4½ pay yards in 45 to 60 seconds. Loading distance in shallow roadside cuts ranges from 75 to 85 ft. Haul, dump and return on a 2000-ft. cycle through traffic takes only 3½ minutes. Making a round trip every 4½ minutes, each Tournapull delivers 12 loads ... 54 pay yards an hour.

Average 25 m.p.h. job-to-job

Fryinger takes additional advantage of the rubber-tired "D's" speed and mobility by driving his rigs over main highways from job to job. Two Tournapulls made the 90-mile trip from Columbus to their present job at Tiffin in 3½ hours.

You'll find this versatile, 7-yd. (9-ton) D Roadster a time and money-saver on all your dirtmoving jobs, too ... either as a self-loading, odd-job tool, or in fleet operation with a pusher. Ask your Le-Tourneau Distributor for job-proved facts and figures. Call him, or write TODAY.

VERSATILITY for extra profits

In addition to 7-yd. Carryall Scraper, and front-mounted Bulldozer blade, D Tournapulls perform almost any power lawnmower job with these add-ons:



7-yd. Carryall
TOURNAROCKER



10-ton flat-bed
TOURNAHAULER



7-ton hoist
TOURNACRANE



V-type
SNOW PLOW

LETOURNEAU
PEORIA, ILLINOIS



TOURNAPULLS

FOR LOWEST NET COST PER YARD



AT ADDISON: Panels are lifted by three-section strongback. They are easily juggled into final position in wall by two workmen. Panels vary in weight; heaviest is 19,000 lb.



AT ADDISON: Steel frame is erected inside of precast panel walls to carry roof. Panels are joined together by poured-in-place columns, some of them encasing steel columns.

After the column footings and floor were poured, the floor surface was treated with form oil. Then forms and reinforcing steel for the wall forms were set on the floor. First a 1½-in. layer of vermiculite (Zonolite) concrete was poured, followed by 4½ in. of 3,500-lb concrete. The vermiculite concrete becomes the self-insulating inside wall surface. No finish except troweling was given the top surface of the slabs, which became the outside wall. Alternate horizontal reinforcing bars extended 4 in. beyond the panel ends to serve as dowels for tying into

the columns. These were bent over inside the end forms while the panels were cast. Also, Superior coil loop anchors were cast in the top edge of the panels to serve both as lifting eyes and for anchoring the roof beams. Steel windows and door frames were grouted into the walls after the panels were erected.

After the panel forms had been stripped and the concrete had been cured, the Tournac crane moved in for erection. Panels were lifted by a 3-part strongback, set on to the shelf formed around outside of the floor slab to check location and fit,

then were lifted while grout was slushed over the wall base. Timber braces held the panels until the columns tying them together could be poured. The steel frame was erected prior to pouring of columns.

The roof was built up of precast vermiculite concrete panels cast at the contractor's main yard and trucked to the job.

Leonard Borisof and A. L. Clesceri, partners in Bee-Cee Builders, personally supervised the job. Pictures and information were supplied by R. G. LeTourneau, Inc., Peoria, Ill.

2. Truck Crane Sets Panels From Outside



AT KANSAS CITY: Northwest truck crane working around outside perimeter of new warehouse and office building tilts precast panels into place. Previously-set panels are braced to anchors cast in floor slab.

TILT-UP CONSTRUCTION forms the walls of the new regional office and warehouse being built for the Pittsburgh Plate Glass Co. at North Kansas City, Mo. Here 38 precast panels, from 14 to 18 ft wide and 10 to 13½ ft high are being worked into the walls of a one-story building, covering 52,000 sq ft, amid cut stone sills and glass block bands.

Instead of casting the panels directly on the floor slab, J. E. Dunn Construction Co., of Kansas City, set their wall forms on a continuous bottom of plywood carried by 3x6-in. stringers placed on the floor. These stringers later became part of the roof framing. Edge forms, and those blocking out wall openings, were 2x6's.

After the panels were cast, Dunn used a Northwest truck crane working from the outside of the building, for their erection. Lifting was by a strongback beam bolted

through holes cast in the panels. After the panels were set, the strongback was removed, but the same bolts were used as fastenings for turnbuckle braces holding the panels in place from anchors cast in the floor slab.

Panels were 5½ in. thick. They were set in grout 24 in. apart to allow for cast-in-place concrete columns that would eventually tie them together. Instead of dowels, bond between panels and columns was by a deep key cast into the panel ends.

Panels weighed up to 7 tons each. They were erected in fast time—eight panels were set one day in 2½ hr., eight more were placed the next day in 2 hr. Top of slabs (exterior surface) was given a broomed finish.

Everitt-Bleistein Associates, architects-engineers, designed the building. Information and pictures came from them, and J. E. Dunn Construction Co., via Tip Brown, CONSTRUCTION METHODS AND EQUIPMENT representative in Kansas City.



AT KANSAS CITY: Panels are lifted by strongback bolted through wall; bolts later hold temporary interior bracing. Panels are cast on plywood forms supported by stringers on floor. Keys formed along slab edges bond walls to poured-in-place columns.

3. Vacuum Curing of Slabs at Peoria



AT PEORIA: Wall slabs, cast on nearby platform, are cured by vacuum mat. Later, they are lifted through same vacuum mat by Lorain crane to storage racks.



AT PEORIA: By manipulating two load lines, crane operator juggles precast panel from horizontal to vertical position by vacuum mat for storage.

IN BUILDING two new 4-story dormitories for Bradley University at Peoria, Ill. V. Jobst & Son, of Peoria, used the tilt-up system for all walls, both exterior and partition, cured by the Vacuum Con-

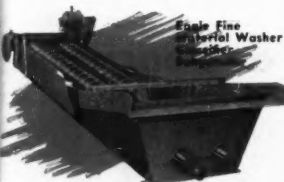
crete Co. vacuum process. Panels were cast at a central yard adjacent to the site, and after curing, were lifted to storage racks by vacuum lifters handled by a Lorain crane. A strongback engaging

lifting eyes cast into top of panels handled the slabs for setting in place.

The dormitory design differed from the other two buildings described in this series in that panels



Essential for today's demand for clean aggregates. Sizes to handle 90 to 350 tons per hour. Also single screw units.



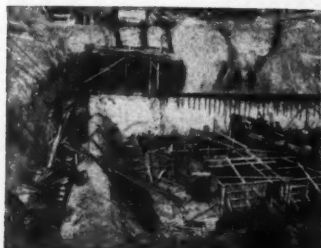
Reject or retain fines at will by raising or lowering lips of U-shaped weir. Washes sand clean—delivers it free of excess moisture. Sizes 15 to 200 TPH.

a good wash day
EVERY DAY at Karl
Hehl's gravel plant—
with **EAGLE Washers**
on the job!

Eagle Washers rule out "wash day blues" at the plant of Karl Hehl, Adams City, Colo. An Eagle double screw coarse material washer loosens and soaks pit-run material, washes it and delivers it dewatered to a vibrating screen. An Eagle double screw fine material washer, with adjustable long weir, washes, classifies and dehydrates sand which passes through the screen. A simple, economical, compact plant providing a range of readily marketed materials. Iowa Mfg. Co. designed the plant and made the "Cedarapids" conveyor, bins and screen. End "wash day blues" at your aggregate plant—send for Catalog 47.



EAGLE IRON WORKS



Sewage Disposal Plant, Long Beach, L. I., N. Y.—Foundation's wellpoints dried up site permitting Horn Constr. Co. to work 20'-24' below water elevation.



25 YEARS EXPERIENCE
for **SATISFACTION**
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WELLPOINT SYSTEMS
RENTAL • SALES
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TILT-UP WALL . . . Continued



AT PEORIA: Various size panels, cast solid, are fitted around wall openings. Here precast panels also make up interior walls as well as exterior. Outside walls will be veneered with brick.

were cast solid in various sizes, without openings, and were then fitted over and around the wall openings. All slabs were smooth finish on both sides. Exterior walls are covered with a brick veneer; all interior surfaces are painted.

All wall panels, both exterior and interior, are tied together by 5-in. monolithic floor and roof slabs, that eliminate columns and interior framing.

V. Jobst & Son, contractor on the job, rented two Lorain cranes from their neighbors, Swords-McDougal Co. Jack Richert is superintendent for Jobst. Pictures and information were supplied by Thew Shovel Co.

How to Conserve Rubber

AN EXCELLENT Conservation Maintenance Plan for mechanical rubber goods has been worked out by Quaker Rubber Corp., Division of H. K. Porter Co., Philadelphia 24, Pa. The plan is available without cost to all contractors and other users of rubber goods by simply writing the company.

Heart of the plan is a booklet covering selection, inspection, maintenance and repair of flat belts, V-belt, hose and gaskets. Pertinent points covered in the manual are reproduced on a wall chart for hanging in the shop.

Users of the Quaker CMP program will also receive, periodically, helpful, usable suggestions and ideas on conservation and maintenance of rubber products.

BALANCED

For SAFETY



THIS . . .



NOT THIS . . .



HOLD ON! When you're hunched over a roof's edge, perched on a ladder, or leaning from a scaffold . . . you'll find it safer and easier to use a Speedmatic!

Here's why: Speedmatic is the *balanced one-hand power saw*—doesn't require both hands to operate—one hand always free for support . . . doesn't force you to lean perilously near the edge. The blade is on the right, the safest location. While sawing, Speedmatic rests on the main piece—no risk of saw falling to the ground. At the finish of cut-offs it doesn't suddenly nose-dive and throw you off balance.

For roof, ladder or scaffold work, remember this:
"There's no safer saw than a Speedmatic!"



MODEL K-99
8" blade—2 1/4" cut.
Three other sizes:
7 1/2", 10 1/4", 12"

Speedmatic

SAWS

TRY A SPEEDMATIC Examine one at your dealer or supply house. Lift it. Notice how it assumes a balanced, ready-to-cut position. Press the trigger. Notice how it starts without torque, twist or jerk. *That's true balance!* Buy it—and enjoy safer, easier sawing from that day on.

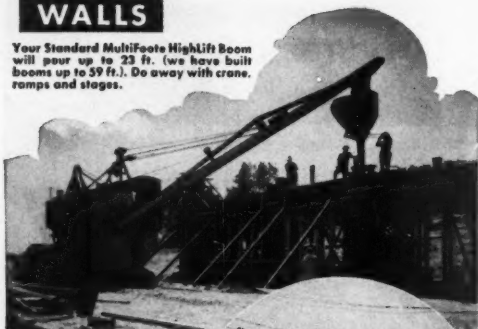
PORTER-CABLE Machine Co., 7028 N. Salina St., Syracuse 8, N.Y.

In Canada write: Strongridge, Ltd., St. Catharines, Ont.

Manufacturers of SPEEDMATIC and GUILD Electric Tools
The Balanced Line

WALLS

Your Standard MultiFoote HighLift Boom will pour up to 23 ft. (we have built booms up to 59 ft.). Do away with crane, ramps and stages.



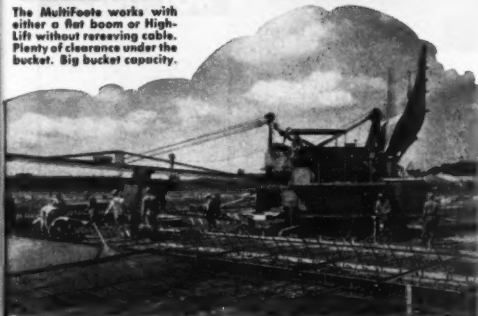
FOOTINGS

Crawlers take the MultiFoote where wheels would need mats, between footings and over the rough going of the usual construction job.



FLOORS

The MultiFoote works with either a flat boom or HighLift without reversing cable. Plenty of clearance under the bucket. Big bucket capacity.



ROADS

With a MultiFoote you are equipped to bid on road work or general construction. Even the 27-E will handle the small road job.



Equip for ANY POURING JOB!

THE MultiFoote brings you *paver speed* to all your concrete pouring jobs. Paver mixing gives you mixing control! With the HighLift Boom you can pour direct to forms or buggies. You can feed hoppers or Pumpcrete. You can load high truck bodies. The HighLift Boom eliminates the crane, cuts waste, reduces the number of buggies required and frees labor for other work.

Lower the boom and you are ready for floors, or on housing work you can pour walls, walks and curbs, practically in one operation. Crawler traction takes you over "rough going" for pouring footings or retaining walls.

And, there is a size MultiFoote for any job. If the 27-E, with its 50 batches isn't big enough, there is the 34-E Single with 50 batches (34 cu. ft. to the batch), or the DuoMix with 86 batches (34 cu. ft. to the batch).

They're fast. Big, open-end skip takes the batch truck without bumping; big buckets with ample clearance beneath them. Easy control, fast charge and discharge. Don't figure a pouring job without finding out what the MultiFoote will do. Get *all* the facts! Don't be misled by theoretical capacities.

THE FOOTE COMPANY, INC.

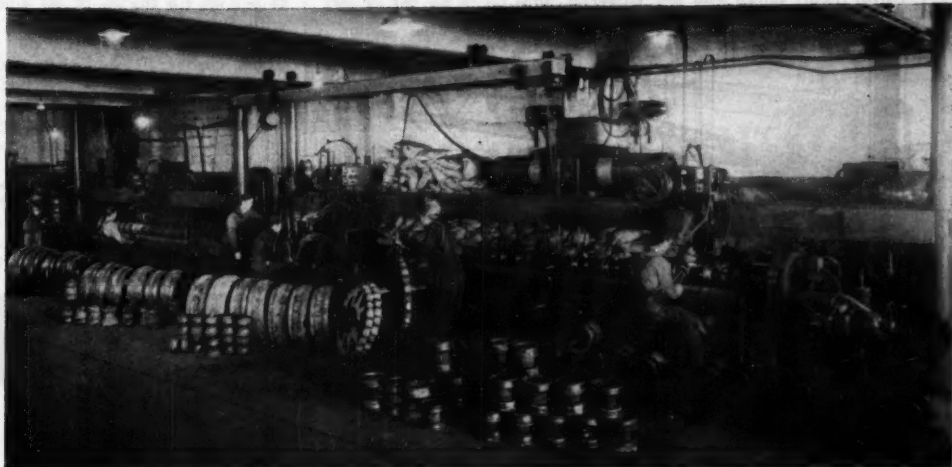
Subsidiary of Blaw-Knox Co.
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MULTIFOOTE

HIGH LIFT BOOM
TRADE MARK

FOR EVERY PLACE CONCRETE MUST BE POURED





THREE AUTOMATIC Lincoln heads are at work here reclaiming worn tractor rollers and idlers. Two fixtures for doing eight rollers at one time and a positioner for turning idlers are located under movable beams carrying the heads.

Automatic Weld Surfacing Reclaims Scarce Tractor Parts

RECLAIMING OF WORN tractor idlers and rollers with automatic arc-weld surfacing has become a major operation in equipment maintenance departments and welding job shops. Reclaimed parts

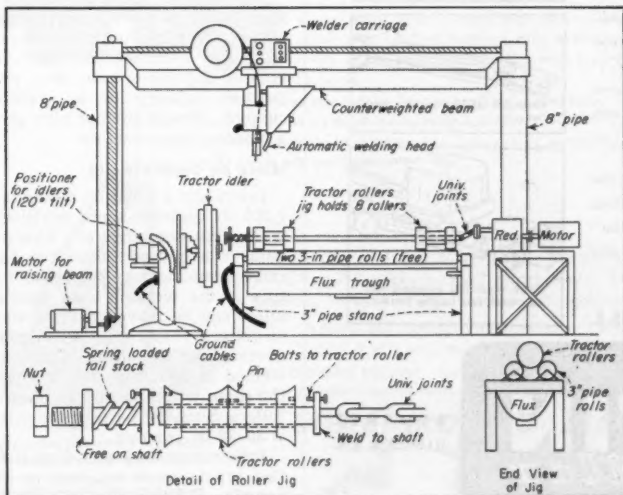
not only get around the serious shortage of repair parts, but also the reclaimed idlers and rollers are giving, on the average, a service life twice that of new parts.

L. L. LeJeune, Minneapolis, add-

ed a hard-surfacing service to his welding business in 1948 and has doubled the output of his department every year since. He has three standard Lincoln automatic hidden arc heads, a semi-automatic unit and several manual machines in operation on this job. His equipment and procedures are developments of experience in reclaiming thousands of worn rollers, idlers, and other parts for tractors and other crushing equipment.

The fixture made by LeJeune for reclaiming rollers is a relatively simple one. Rollers are mounted on a shaft driven by a motor and reducer, to which it is connected with a double universal joint that insures level work. Eight rollers are mounted on the shaft and locked with a spring-loaded tail stock. The rollers ride, as they revolve for welding, on two guides of 3-in. pipe running parallel to the main shaft. The carriage-mounted welding head is located above the fixture on a travel beam and moves across the eight rollers to build up a deposit of weld metal one layer at a time. The movement of the head is synchronized with that of the roller so for each revolution of the fixture the head moves longitudinally $\frac{3}{16}$ in. By thus building up a number of rollers at one time, the danger of overheating through rapid multiple-pass welding on a single roller is eliminated.

The only preparation of rollers for welding is wire brushing. Usually one layer of metal is suf-



DETAILS of fixture and positioner for automatic welding of tractor rollers and idlers.

E. E. Barber (right), shown with E. E. Barber, Jr. and M. C. Brown, is head of the E. E. Barber Construction Co., Fort Smith, Ark. The company uses its Martin Trailer to haul everything from D7's to a 54,000-lb. crane.



SAVE... TIME IN LOADING-UNLOADING
ELIMINATE... DETOURS AROUND LOW CLEARANCES
HAUL... MORE PAYLOAD

WITH MARTIN "FOLDING GOOSENECK" TRAILER!

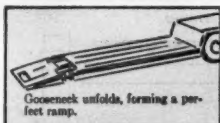
■ E. E. Barber, Fort Smith, Arkansas, says, "The Martin 'Folding Gooseneck' Trailer is superior to any trailer I've used or seen. It saves time in loading, its low height provides ample clearance, its weight allows more net load."

HOW THE MARTIN "FOLDING GOOSENECK" WORKS and SAVES

The "Folding Gooseneck" does away with the dangers and time of building loading and unloading ramps and blocking... low platform height carries equipment of every type under low bridges, wires and underpasses... rugged, all-welded, frame construction cuts dead weight and allows big loads to be carried within legal limits.

Martin "Folding Gooseneck" Trailers are the most modern answer to equipment hauling problems. Ask your Martin "Caterpillar" Dealer about the size that can save on any haul for you. Do it today!

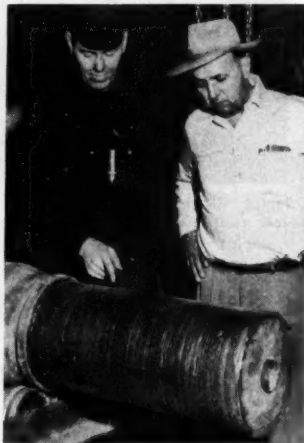
MARTIN MACHINE CO., Kewanee, Ill., U.S.A.



MARTIN
The Trailers

**KEWANEE
 ILLINOIS, U.S.A.**

sufficient for the build-up, put down with 500 amp at 28-32 v with a 3/16-in. automatic electrode of 0.50% carbon. The speed is about 1 rpm. When rollers are badly worn, two layers of weld metal are deposited, and occasionally a single finish pass of a hard-surfacing 5150 alloy is deposited. The travel speed of the head of 3/16 in. per rev of the roller results in a flat surface, and the parts can go back into service in the as-weld condition without machining. A high-



OTHER CONSTRUCTION machinery parts, such as this 12-in. shaft for a gyrotory crusher, are also built up by automatic welding equipment in LeJeune shops at Minneapolis.

alloy flux is used with the high-carbon electrode, and the pick-up of alloy from the flux produces ideal weld metal for reclaiming rollers. Welding with dc current with the electrode negative increases deposition rate 50% over positive polarity or ac welding current. Direct current also gives a more uniform surface.

Idlers on Separate Rig

Idlers are welded on a standard 1,200-lb variable-speed positioner with a 120-deg angle tilt. This positioner is placed under the carriage beam next to the roller fixture so the welding head used on idlers can be moved over to work on rollers when necessary to avoid overheating the idler. Idlers are welded at 500 amp, 28-32 v with the same wire and flux as used on rollers. Surface speed of the idlers is 30-32 in. per min.

Information and illustration for this article were supplied by the Lincoln Electric Co., Cleveland, Ohio.

MIXERMOBILE MANUFACTURERS completely *Portable* CONCRETE

- WEIGH BATCHING
- MIXING
- ELEVATING **PLANT**

CAPACITY UP TO 50 CU. YDS. PER HOUR

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This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.



MIXERMOBILE WEIGH BATCHER • Model WB-1

Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

- Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.
- Charging skip hydraulically operated.
- Bin selector located by skip control directs skip.
- Equipped with either dial or beam scales.
- Weight, 17,800 lbs.; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).
- Mounted all around on 8.25x20 tires.



2-YD. MIXERMOBILE • Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- Improved batch-timer and counter insures positive mixing time.
- New electronic water meter gives unerring accuracy.
- Sturdy planetary drive hoist clutches give extra power, durability.
- Mixes up to 30 cu. yds. per hour.



SCOOPMOBILE • Model C. The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard $\frac{3}{4}$ -cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- Loads and transports aggregate.
- Transports, elevates and pours concrete.
- Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.

ATTACHMENTS INCLUDE: Scoop buckets in various sizes, swivel and standard type concrete hoppers in $\frac{3}{4}$ cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.



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TRIPLE 6-IN. LINE and walkway run from mooring station over bulkhead to oil company tanks on New Haven, Conn. shoreline. Bulkhead, oil intakes and extended storm sewer culverts preceded dredg-

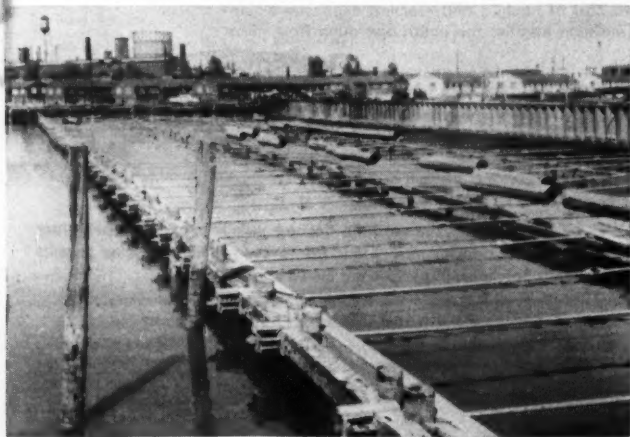
ing and hydraulic fill operations. Note pump line at left breaking into two sections at Y connection. One runs straight along culvert to shore, other curves to run along top of...

Hydraulic Fill to Support Relocated Highway

ANOTHER MAIN ROAD is going to bypass another big city—this time U. S. No. 1 at New Haven, Conn. The unusual operation there, however, is the dredging of more than 3,000,000 yd of sand and gravel from the harbor floor and hydraulic fill of four major shore line areas to support the relocated scenic highway.

In area "D", the area pictured here, three major problems confronted the Connecticut State Highway

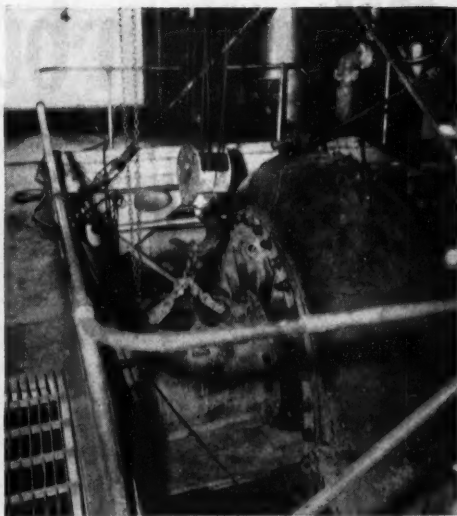
Department before they could give the go-ahead signal for dredging. These were (1) erection of a steel sheet-pile bulkhead, (2) extension of railroad and city storm sewer culverts out beyond this new bulkhead, and (3) relocation and extension of intake lines for off-shore unloading of fuel oil to tanks of a local company. Structures were awarded to C. W. Blakeslee & Sons Inc. of New Haven, who sublet the bulkhead to a neighboring firm, New England Dredge and Dry-



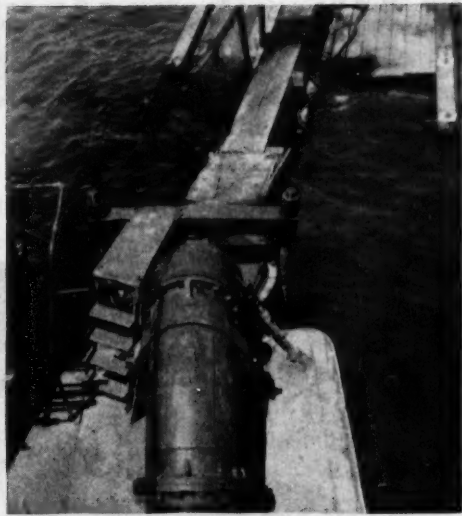
... SHEETPILE BULKHEAD which is tied back to row of 70-ft timber piles. Controlled fill was placed evenly outside and inside wall to prevent mud waves and uneven pressures. After inspection,



clay cutter (right) on bow of Arundel Corp.'s dredge "General" goes down to cut another swath in harbor floor. Rig deepens channel depth from 35 to 50 ft, sucking sand and gravel through 27-in. line.



HUGE ARMOR-PLATED IMPELLER sends fill shoreward. Small electric winch is fastened through 8-part line to clean-out cover where large rocks lodge occasionally. From there, dredge's line



runs back to swivel joint astern (right), through flexible connection to 22-in. dia floating discharge line. Five steps indicate huge size of swivel joint which allows rig to swing in 250-ft arc.

dock Co. The Arundel Corp. of Baltimore took over the hydraulic fill job, and all hands are cooperating.

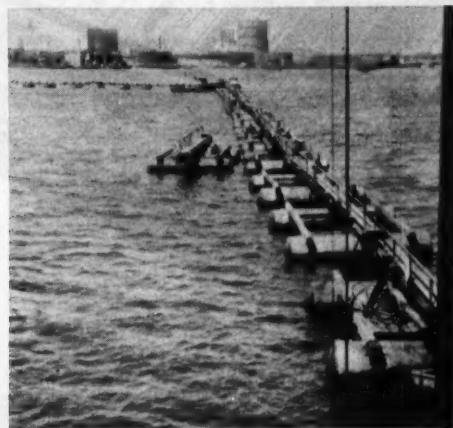
First off, a single intake line to the Benedict Oil Co. was removed and replaced with three parallel 6-in. lines, 1,900 ft long. These run along the original shore line, then right-angle out along an old city canal dock which was reinforced and planked over. A walkway and floodlights accompany the triple line out beyond the bulkhead to a mooring station in the channel.

Meanwhile, a twin 6x6 ft concrete storm sewer culvert was continued 1,600 ft from its original outlet to end flush with the sea wall, fitted with control gates and appurtenances. A parallel pipe drain for the

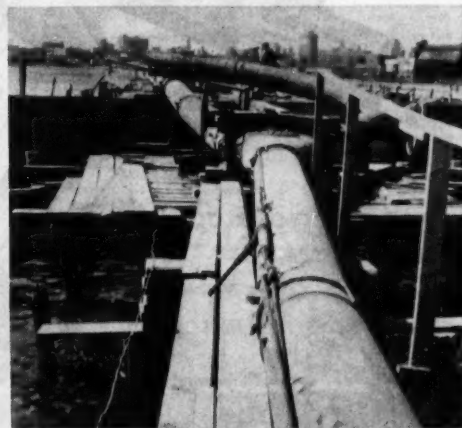
New Haven R.R. was similarly extended.

The bulkhead itself is a rather tricky job. It consists of a 724-ft run of 50-ft lengths of interlocking sheet-piling, capped with a continuous inverted channel. The 50-footers give way to 60-footers for a 150-ft length in the deep water area. Top of the piling is at El plus 10 MLW; bottoms are El minus 40 and minus 50 respectively, and the channel bottom averaged minus 12 at the start of work. Paralleling the sheet-piling 100 ft shoreward is a double line of 12x12-in. timbers which sandwich the tops of 70-ft timber piles, six to a cluster on 9-ft 9 3/4-in. centers. Three of these piles are plumb, the other three battered toward the

(Continued on page 78)



TWO PONTOONS, 18 ft long and 6 ft dia, support each 50-ft length of discharge line. Note spare section alongside, complete with handrail, phone lines, plank deck and anchor winch. At time



of photo pontoon line was 1,850 ft long. Note ratchet jack and wire rope (right) which holds sections securely on pounding, pulsating line. Pipes are rotated occasionally for even inner wear.

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- BUILT TO "TAKE IT"
- EASY TO OPERATE
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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

EASY TO OPERATE

Operators have long awaited the greater handling ease and comfort now brought to them by this new line of Allis-Chalmers tractors.

Conveniently located controls respond to the slightest effort . . . and are operated in the same familiar way — nothing tricky to “catch on to.” There is new shifting ease, new seat and platform comfort, full visibility.

Because the operator's job is easier — takes less effort — he can maintain a steady pace, do a better job throughout his shift . . . day after day.

Look over some of the many reasons why this **NEWEST, FINEST TRACTOR LINE ON EARTH** is easy to operate . . . as well as being built to “take it,” easy to service and entirely new in performance. Then get the full story from your Allis-Chalmers dealer.

✓ Revolutionary shift pattern. A quick, one-lever shift from any forward to any reverse speed. No “double” shifting to obtain high reverse speeds. Saves time and effort.

✓ Master clutches with large diameter plates, and steering clutches with hydraulic or mechanical boosters, require less effort. All control linkage is equipped with anti-friction needle bearings.

✓ Steering brakes are self-energizing for both forward and reverse travel.

Pedals adjustable to operator.

✓ Quick electric starting on diesel fuel from operator's seat. Tractors go to work faster. No fuel waste or engine wear by needless idling to avoid restarting.

✓ Throttle control, conveniently located, easy and positive (stays put).

✓ Roomy, adjustable cushioned seat with wide arm rests. Operator works in real comfort with either front or rear-mounted equipment.

✓ Full visibility. Tapered hood, narrow cowl and clean rear-end design provide clear view of front and drawbar work.

✓ Ample leg room. Clean platform. Foot rests for added comfort on larger models.

✓ Built-in primer system (standard) makes starting quick and easy even in sub-zero weather.



40.26 drawbar hp.
11,250 lb.



70 drawbar hp.
18,800 lb.



102 drawbar hp.
27,850 lb.



Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

The Newest, Finest Tractor Line on Earth!

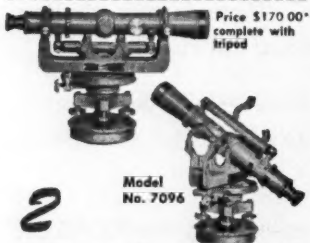
Choose

the exact instrument
you need from these three
LOW PRICE MODELS



Model No. 8014
Price \$145.00*
complete with tripod

Finest 12" Dumpy Level available anywhere—gives you more features you want, more accuracy, more durability at less money than any other instrument. It has dust and dirt-free internal focusing and has coated optics for clearer distortion-free, sharper images.



Model No. 7095
Price \$170.00*
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Here's the standard convertible level for the country for the past 30 years! No other instrument has the recognition and acceptance as given to the David White Carnegie Improved Convertible level. Now it's available to you with complete dust and dirt-free internal focusing and coated optics for clearer, sharper, distortion-free images.



Model No. 3000
Price \$185.00*
complete with tripod

The David White "Universal" level-transit is the most practical and complete builder's instrument on the market. Now available in a new improved model—complete with internal focusing, coated optics—guaranteed vertical arc—in fact every possible feature to assure you lifetime durability and extreme accuracy.

CHOOSE the exact instrument you need from these three. Compare their outstanding features, their precise, yet rugged construction, their accuracy and their price with all others. Then you'll see why we say you'll buy "right" when you buy a David White. For complete information on any one or all three of these instruments, consult our nearest dealer—or write direct to David White Co., 343 West Court Street, Milwaukee 3, Wisconsin.



We offer complete, prompt repair service on all makes of instruments—levels, transits, theodolites, etc.

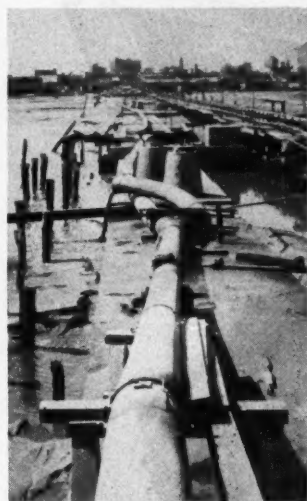
HYDRAULIC FILL . . . Continued
bulkhead at 30 deg. Tierods pass through the bulkhead at El plus 3 and into the pile clusters at El plus 2. They are 2½ in. dia, up-ended to 3¼ in. Two lines of intermediate timber piles are capped with 4x6's and support the 3-section, 100-ft-long tierods at their third points where adjustable turnbuckles are located. One end of the bulkhead will tie securely into an old dock, although several sheets have been left out temporarily to provide for water runoff. After passing under the oil inlet lines and beyond the storm sewer outlets, the farther end stops abruptly and hydraulic fill will eventually flow in an easy slope beyond.

Lower Channel 15 ft

Dredging operations are delicate and flow is limited in and around the bulkhead, culvert, piers, wharves and boat slips. The Arundel Company's dredge "General" anchored above the first of four borrow areas so as to traverse a 250-ft arc. Channel depth averages 35 ft and the rig is digging 20 ft below this level. Turbulence scours a 5-ft layer back in place, leaving an ultimate channel depth of 50 ft. By experimenting during the first week of operation with various cutting heads, they found that best results came with a clay cutter, although the underwater fill is mostly sand and gravel, with some rock. A 27-in. dia suction line below the cutter boom pulls 85% water and 15% solids up through a huge impeller, along the deck, into a swivel connection

which ties in with a 22-in. discharge line. This is carried 1,850 ft on pontoons, finally connecting with several shore lines (also 22 in. dia) up to 2,000 ft in length.

Filling in on both sides of the culvert and bulkhead was a delicate job, limited by specifications to 200 yd/hr and only during daylight hours. Upon reaching the sheetpiling, the first discharge line was run along the top of the bulkhead to a T-shaped end connection which assured equal distribution of material in front as well as behind the wall. This prevented uneven strain. In similar manner another



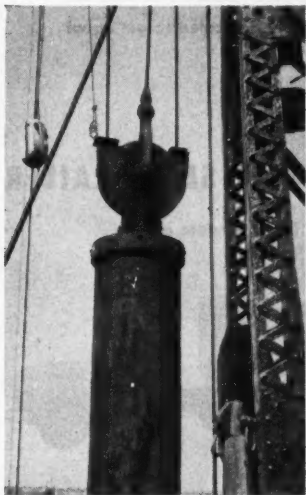
PASSING BULKHEAD, line runs atop extended storm sewer culvert, right-angling again to fill in around piling line 100 ft back.



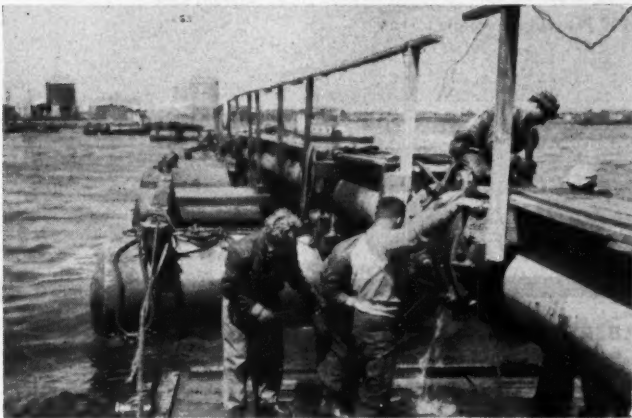
END CONNECTION, called "chinaman," terminates 2,000-ft line ashore; assures spread of fill materials and prevents mounding up. Water makes up 85% of pipe contents; fill materials 15%. Note proximity of piers and wharves which necessitate controlled pumping.

line was strung inshore along the top of the concrete culvert, again flowing evenly on either side to prevent tipping action from built-up mud waves. Filling in around wharf piling and in boat slips called for careful pumping also, to insure solid fill and prevent damage to structures. When the bulkhead, slips, and culvert had been properly filled, volume was gradually upped to 1,500 cu yd/hr of placed fill in open areas.

Crews aboard the dredge are working three 8-hr shifts, 7 days a week. Attending the "General"



STARBOARD SPUD rides high astern and port-sider acts as pivot while "General" walks itself ahead. Each weighs 38 tons.



LINE is temporarily shut down while crews quickly add 300-ft section. Ball-and-socket connections every 100 ft allow for curves in line. Note phone lines which will be connected to keep dredge men in constant contact with shore crews. Fill in open areas is 1,500 yd/hr.

are two launches, the "Rosemary H." and "Saint Lucie." In order to work itself ahead, the dredge depends on its port and starboard bow anchors spaced 250 ft apart and on its two rear bottom-pointed spuds. These 38-ton spuds, used alternately with each swing from port to starboard, walk the dredge ahead for each new swath. Constant checks through transits to shore points keep the "General" in her right area for borrow.

A flexible connection leads off the underside of the stern swivel joint into the first floating section. Two pontoons, 18 ft long and 6 in. dia, support each 50-ft length of pontoon line. Alternate connections are flanged and ball-and-socket all the way into shore. Any ball-and-socket can be quickly disconnected to attach additional pipe in multiple lengths of 100 ft as the dredge moves ahead.

In all, some 3,060,000 yd of fill will be placed. In the first month of operation 168,000 yd were placed in controlled areas, but that will be boosted appreciably, since the contract calls for completion in 300 days.

Personnel

W. A. Mullins is superintendent for The Arundel Corp., assisted aboard the dredge by Joe Williams. Cecil Joyce is dredge captain. Supervision for the Connecticut State Highway Department includes E. T. Nettleton, district engineer; L. J. Conaty, division engineer of construction; Milton Beecher, project engineer; and Ray McKnight, chief inspector.

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UNDER STREETS, WALKS,

TRACKS, FLOORS



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No. 780 GREENLEE PUSHER
For 3/4 to 4-inch pipe. Six speeds—5,500 to 40,000 lbs. pushing pressure.



No. 785 GREENLEE PUSHER
For pipe larger than 4-inch, concrete sewer pipe, large drainage ducts. Six speeds—25,000 to 130,000 lbs. pushing pressure.



POWER PUMP for both sizes of GREENLEE Pushers. Pushes pipe at rate of two feet per minute.



Get facts on timesaving Greenlee tools now. Write Greenlee Tool Co., Division of Greenlee Bros. & Co., 2188 Columbia Avenue, Rockford, Illinois, U. S. A.

THE MAN SAID:

"Give me a dump semi-trailer that is interchangeable for use with a 4-wheel or 6-wheel tractor—with maximum axle spacing for legal load limits."

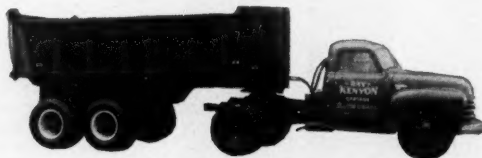
Then TALBERT developed a new idea in dump semi-trailers:

● We located the twin hoist in the rear of the frame to permit FORWARD ACTION for light-weight, easy, lift—with the force of the hoist action "over the wheels"—and eliminated the heavy forward frame. The frame is drilled so that the tandem can be relocated to get equal load distribution with either a 4-wheel or 6-wheel tractor.

FIRST WE GAVE THE MAN:

THE TALBERT STANDARD DUMP SEMI-TRAILER

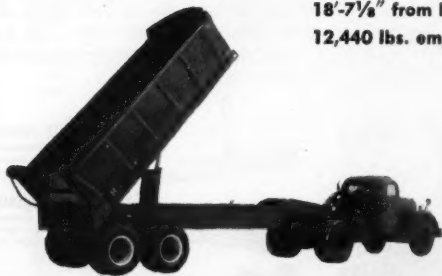
11'-10 $\frac{3}{8}$ " from kingpin to center of lead (first) tandem axle
11,500 lbs. empty weight



THEN:

THE TALBERT EXTENDED DUMP SEMI-TRAILER

(to get the maximum spacing from kingpin to tandem)
18'-7 $\frac{1}{8}$ " from kingpin to center of lead (first) tandem axle
12,440 lbs. empty weight



"FORWARD ACTION"



HYDRAULIC DUMP

ALL TALBERT DUMP SEMI-TRAILERS HAVE:

- "quick coupler" hose connections
- spring tandem suspension
- air brakes—all wheels
- regulation ICC lights
- tubular axles

TALBERT CONSTRUCTION EQUIPMENT COMPANY

7950 West 47th Street • Lyons (Chicago Suburb), Illinois

GULF PRODUCTS *and* **FINE SERVICE** *keep equipment rolling on Western Extension of the Pennsylvania Turnpike*

Rochez Bros. Construction Co., East Pittsburgh, Pa., has a 3-mile section of the Western Extension in Allegheny County. The job involves moving over 800,000 cu. yds. of earth and over 90,000 sq. yds. of concrete paving.



THE Western Extension of the Pennsylvania Turnpike is another big and important project where the majority of contractors rely on Gulf to help keep equipment delivering top performance.

Leading contractors, like Rochez Bros. Construction Company for example, know from experience that Gulf quality lubricants provide an extra margin of protection against mechanical delays. And that Gulf fuels insure full engine power and efficiency.

Then, too, they appreciate the engineering counsel Gulf provides to assure the most suitable lubricants and fuels for every unit and operating condition. And Gulf's prompt delivery service.

Let us discuss with you how Gulf products and services can help you on your next job. They are available to you through more than 1200 conveniently located warehouses. Gulf Oil Corporation • Gulf Refining Company, Gulf Building, Pittsburgh, Pennsylvania.



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A User Says:
"47,000 lifting
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340° temperature"



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LEAKPROOF, WEARPROOF, high pressure packing seals of Neoprene.

SPRING CONTROLLED, NON-STICKING, Ball Valves for trouble-free operation. **HORIZONTAL or VERTICAL OPERATION** with double lever sockets to speed work.

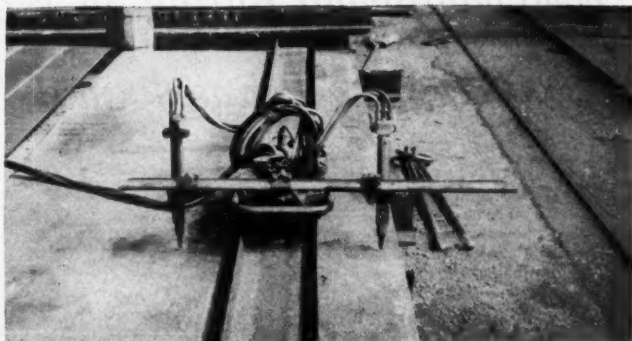
SMOOTH ACTING RAM of SAE X1112 steel, machined and ground to minimum tolerance.

Put a Simplex Hydraulic to work on your tough jacking jobs to save time and manpower. Available in eight models with capacities from 3 to 100 tons — safety-tested to 50% over rated capacity.

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Automatic Welder Fabricates



PARTS FOR FABRICATED structural members by automatic welding are cut from flat plate stock by twin blowpipes riding a carriage on tracks. The I-beam track can be moved over the plate as desired. Cutting both sides of strips at same time eliminates distortion.

By R. E. PETERSON,
Plant Manager, Virginia Bridge Co.,
Memphis, Tenn.

SHORTAGE OF ROLLED SECTIONS, especially in the larger sizes, has led Virginia Bridge Co. into fabrication of big beams by automatic welding, with the submerged arc process doing the main job. We have rigged up some special jigs to hold and position the beams during fabrication, and have also built special tracks for guiding cutting torches and the submerged arc head. With introduction of this equipment, the welding time of fabrication of beams from plates has been reduced to one-fifth of that previously required. In addition to easy building up of standard sections, we find this set-up permits fabricating special sizes and shapes most economically.

First step in the production of one of these beams is to cut out the parts from standard sizes of plate with twin blowpipes mounted on a mechanized carriage. A track for the carriage is laid on the plate and the two cuts are made simultaneously, which has the advantage of controlling distortion by trimming both sides of the plates at once.

A typical example is the fabrication of an 18in.x44in.x49-ft I-beam. The flanges were cut from 1½-in. plate, and the webs from ¾-in. plate. The web flanges and stiffeners were assembled and tack-welded by manual arc. The tacks joining the flanges to the web are 3 in. long and were spaced 10 to

12 in. apart. Angles and C-clamps held the parts in alignment during assembly.

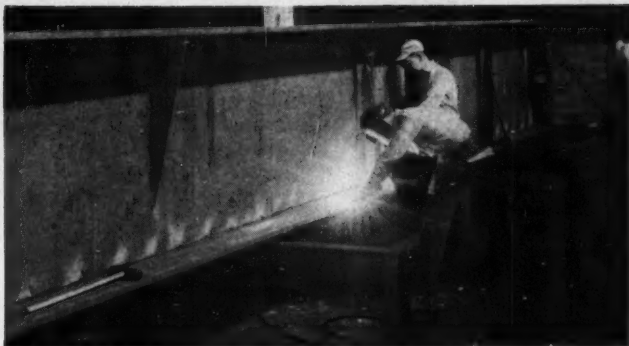
The welding area includes two trunnions, two welding tracks and a portable submerged arc-welding machine riding on another mechanized carriage. The double track makes it easier to move the welding machine from one track to the other instead of turning the beam. This step is required for welding the back side of the two fillet welds previously made.

Before moving the assembled beam to the welding station, axle plates are centered on the ends of the web and tack-welded in place. The axles were made up simply by driving a piece of round stock into the race of a ball bearing and spot-welding it in place. Then the case of the bearings was welded to the plate. This method of supporting the assembly in ball bearings has paid off in the ease with which the beam can be positioned for automatic welding.

The welding machine runs on tracks at either side of the beam. These tracks consist of 10-in. channels tack-welded to H-beams. The submerged arc-welding machine is a compact, portable unit consisting of the welding head, rod reel, and control unit mounted on a mechanized carriage. Once the beam is positioned and the alignment set, the welding is automatic.

Granulated slagging material is gravity-fed from the hopper on the machine to the welding zone. A portion of the material melts in the welding zone, covers the weld

Heavy Beams From Plates



A 49-FT BEAM begins to take shape. Web, flanges and stiffeners are clamped in position and tack-welded by manual arc. Then this assembly is ready for final welding by submerged arc in trunnion jig.

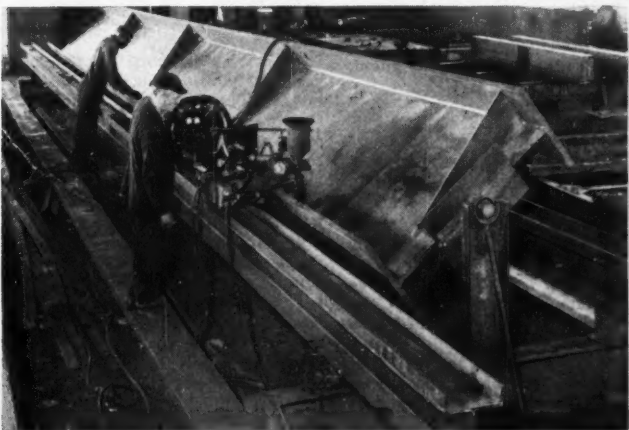
puddle and protects the molten metal from the air. Welding takes place quietly without flash, glare or spatter. The unfused composition is picked up by a vacuum recovery unit. On cooling, the fused composition pops off revealing a smooth, clean weld underneath. The positioned-fillet welds, made on both sides of the web, are completely penetrated and interlocked. Welding conditions are 34 v, 940 amp ac. The legs of the fillet welds measure $\frac{3}{8}$ in. and they are produced at a speed of 26 in. per min. With a submerged arc-welding

machine, one operator and helper are able to make 196 ft of fillet weld in 2 hr. This includes positioning the beam for each weld and moving the machine from one track to the other.

We believe the flexibility of design and the ease of fabrication with this equipment are opening up new possibilities in the production of structural members.

• • •

EDITOR'S NOTE: Equipment used in this application was the Unionmelt DS-37 welding machine, Oxweld C-48 Blowpipes and Oxweld CM-37 carriages.



WITH ASSEMBLED BEAM held in trunnion jig, automatic submerged arc-welding head travels on carriage down track applying finished fillet welds. Ball-bearing trunnions permit beam to be rotated to other welder operating on track on other side, eliminating necessity for turning beam end for end.

COMMENT

from the
BUTLER ENGINEER

August, 1951

Alas, Alack, Eheu and Dammit!

Long ago (but still within the memory of some of us who have since grown prematurely old and gray)—a manufacturer could plan production schedules, order his materials and in turn give firm delivery dates to his customers.

Sounds like a fairy tale—but, honest injun, it's the truth!

But for darn sure it's no fairy tale we're living in today. It's a ring-tailed, oscillating, first-class nightmare. Give a look: Vastly increased orders versus drastically cut steel supplies. Steel quotas for civilian use slashed to 9% of mill production... Moreover, we're legally required to fill defense orders up to 25% of our own production and, law or no law, every patriotic manufacturer feels it his duty voluntarily to accept that condition.

We even tried a crystal ball to find an answer, but the future was so chaotically confused the c.b. screamed horribly and burst into a thousand fragments.

Lord knows we're desperately trying to keep our customers happy. And our suppliers are doing their best for us, too.

But you and I and all of us are in the same boat (the good ship ULCER)—so let's not rock it.

•

I was talking with a brigadier general just recently returned from Korea. Upon his arrival in that devastated land he had met a bruised, battered and bandaged sergeant in the French Foreign Legion. "What's it like here in Korea?" asked my friend.

"Sir, zis is ze hell of a war—jus' hell!" Then, with great earnestness, "But better zan no war at all."

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



EARTHMOVING... An Art and a Science

8. Rubber Tires

BY DAN K. HEIPLE, Chief Field Engineer, R. G. LeTourneau, Inc., Peoria, Ill.

This is the eighth of a series of articles on the fundamental principles of earthmoving. Sections on earthmoving history, job analysis, equipment selection, ownership and operating costs, factors affecting production, production and cost estimates, application of bulldozers, scrapers and rippers, and maintenance and repair have already been published in our last seven issues. Still to come are comprehensive articles on such subjects as dirt compaction, and application of other types of equipment.

—THE EDITOR.

SINCE 1932 (when R. G. LeTourneau first put rubber tires on Carryall scrapers), off-the-road tire performance has been a primary factor in the development of high-speed earthmoving equipment. The practical knowledge that a big wheel rolls easier than a small one has created sizes up to the 36.00x41 tire, standing better than 9 ft high, with the 7-ft 27.00x33 a not too uncommon sight. In addition to larger and larger sizes, tire research has produced a variety of tread patterns to give various traction advantages under changing soil conditions.

Having experimented with size and tread design, more recent emphasis

has been toward lower operating air pressures. Letting automobile tire pressure down to get out of a bad spot in sand or ice and snow illustrates the logic of this approach. Nevertheless, the old time rural mail carrier will contend that his new car with super-cushion tires can't touch the old Model T's high-pressure narrow tread for real muddy going.

The experience of the mail carrier shows that although low air pressure can be an answer to many problems, it is not by any means a cure-all. The problem of modern tire development is to incorporate the lessons learned from each of these examples. A partial an-

swer, at least, is a big tire for high clearance. Self-cleaning traction tread can keep equipment working by cutting through top mud to solid footing, like the Model T. The same tire, with tapered beads to hold it tight on the rim, should be able to float at greatly reduced air pressure where no solid footing underlies a loose or spongy top. The general theory of off-the-road tires evolved from such lessons is simple—bigger tires, lower pressures.

Specific experience is not so easily cataloged. Big tires cost a lot of money and an increase in size does not necessarily mean only a proportional increase in cost. Also, because earthmoving is an approximate rather than an exact science, the traction and flotation difference of two tires of different sizes are not necessarily measurable quantities. Of almost equal importance to performance is service life expectancy under adverse conditions and low air pressures. The factors involved which serve to complicate the solution of the problem include: ground contact area of the tire, which is determined by air pressure and load on the tire; tread design; cohesiveness of the soil as a measure of its resistance to shear

(Continued on page 87)



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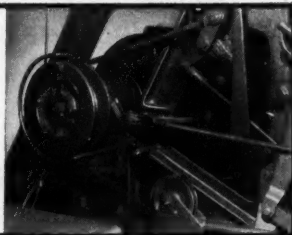
**Another BAY CITY Shovel
helping to rush completion
of the New Jersey Turnpike**

Contractor Louis J. Zimmerman of Hillside, New Jersey knows that it takes man-sized equipment to stand up under the tough production schedule of a big highway construction job. That's why he put his BAY CITY "65" shovel to work at a borrow pit for the New Jersey Turnpike. Like owners and operators everywhere, contractor Zimmerman knows that BAY CITY shovels are engineered from crawlers to boom point for rugged, heavy-duty operation and lasting service. They give you more power plus the extra weight and stability you need to turn out more work every day. Low operating costs mean bigger profits for you. See the many outstanding BAY CITY features at your nearest dealer or write today for complete information. BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN

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Fast-acting power dipper trip is another exclusive BAY CITY feature available on all shovels. It operates electrically or manually by a control located right where you want it—on top of the swing lever. There's no lost time groping for the trip rope—a time savings, operators report, that accounts for up to 25% more yards daily.



BAY CITY



SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

EARTHMOVING . . . Continued from page 84

by the tire; rim width and rolling radius; and the bearing value of the soil as a measure of its ability to support a load.

The U. S. Army, tire and equipment manufacturers, engineering groups and schools have all conducted tests on earthmoving tires to determine the effect of these factors on performance. However, little data is readily available, much of it defies analysis, and much is disappointing when compared with actual job experience. Any discussion, then, must be approached with a realization that most of the information needs further refinement or verification. And some, in time, may be completely revised.

1. Ground Contact:

Within the rated load limits, the same load and the same tire pressure will give approximately the same footprint area for any tire. Eliminating the sustaining value of tire sidewalls leaves the entrapped air alone to carry the load. Then the tire will deflect until sufficient area is in contact with the ground for the pressure under the tire to be equal to the pressure in it. Such analysis eliminates the size of the tire from the equation. As an example, 50-lb air pressure carrying a 5,000-lb load would result in a ground contact of 100 sq in. Doubling the load to 10,000 lb would only cause further deflection until 200 sq in. were making contact.

Actually, however, the tire sidewall does carry a portion of the weight, depending on its size and construction. At loads sufficient to deflect the tire approximately 10% may be assigned to the sidewall. Then:

$$\text{Area of contact} = \frac{0.90 \times \text{Weight on tire in lb}}{\text{Pressure in tire}}$$

For static loading, the formula would also indicate that ground bearing strength must be at least 10% higher than tire pressure for a condition of no penetration.

2. Tread Design:

Basic design of tire tread has a decided effect on the tractive effort that can be produced in different soil conditions. Deep bar treads with self-cleaning properties give maximum traction in cohesive soils where shear values are high.

Conversely, a shallow, rounded, or smooth tread performs best in non-cohesive soils. For instance, in a sand operation, sharp bar treads have a tendency to churn

up the sand, digging themselves in; shallow treads tend to confine and compact the sand under the tire, increasing the internal friction and allowing greater tractive effort to be applied.

Rock tires are simply a compromise of traction with resistance to cutting and bruising. Free rolling tires are designed for load carrying and economy rather than traction, although the result is a low tread pattern suitable to loose soils. Within the basic groups, variation of pattern appears to have little effect on tractive effort.

3. Inflation:

In general, decreasing the air pressure in a tire increases net tractive ability. Some portion of the increase is related to a greater contact area, but the improvement in performance appears to be largely due to a lower rolling resistance. In some instances there may be an actual reduction in the coefficient of traction which is not observed because it is more than offset by the greater reduction in rolling resistance.

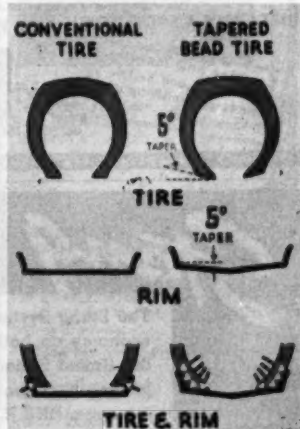
Tire air pressure must be low



TIRE DIFFERENCES are shown by this line up of (l to r): 14.00x32 and 18.00x25, both traction tread; 65-in., wide-base sand tire; and low tread pattern 21.00x25 on special wide rim.



THIS DRIVING TIRE has seen approximately 2,700 hr service in open pit work. Considerable service life is still left before retreading will be necessary.



A RECENT ADDITION to construction tires, the tapered bead, gives greater rim contact and allows lower tire pressures without rim slippage.

1 of 10 Reasons Why UNIT is a Better Machine



UNIT gears, shafts, and many other essential working parts are scientifically heat-treated right at the factory, under the supervision of experts — men who work exclusively on these important operations. Fully equipped, the UNIT heat-treat department includes five, accurate, thermostatically-controlled electric furnaces, where these vital parts are made hard enough, yet tough enough to stand up under the most severe service. Aside from the electric furnaces, there are two completely automatic, flame-hardening machines (illustrated above) — the last word in modern equipment. The split-second, precision control of these machines permits selective hardening — giving each gear the same consistent hardness, strength, and ruggedness. Heat-treated gears and shafts are another example of the "quality extras" that are yours when you choose UNIT — the undisputed leader in producing the most efficient and economical cranes and shovels in the industry.



This is the 9th of a series of 10 ads describing outstanding UNIT features.

UNIT CRANE & SHOVEL CORP., 6305 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile models — 1/2 and 3/4 Yd. Excavators. Cranes up to 20 tons capacity.



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KNOW-HOW
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to keep jobs
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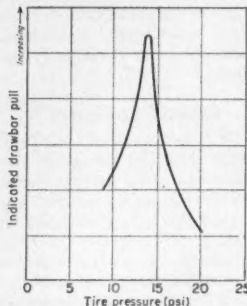
WELLPOINT SYSTEM

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION
2 Broadway 2123 S. 56th St. 8221 Atlantic Ave.
New York 4, N. Y. Omaha, Neb. P. O. Box 631, Bell, Cal.

enough to give a contact area sufficient to support the load without excessive penetration, but also high enough in non-cohesive soils to embrace and compact the material beneath it to get good traction. Actually, air pressures can be too low for best performance.

This is indicated on the accompanying graph showing drawbar pull vs tire pressure for an operation in loose sand. To assume that it is typical for all tires is hazardous, but it illustrates the point. In this case, the indicated drawbar is



a function of the load obtained rather than measured with a dynamometer. However, the curve break is so pronounced as to rule out some of the inaccuracies which might be ascribed to field testing. The data definitely fixes the optimum tire pressure even though actual related drawbar pull is unknown. The variation in indicated drawbar was in the order of about 45%. In this loose sand condition, air pressures below 14 psi apparently were not high enough to compact the sand to a sufficient degree of internal friction to keep it from rolling under the tires.

With the information now available on the effect of inflation, it is impossible to draw a representative set of curves for tire performance. However, scattered data does indicate a few trends:

A. Reduction in air pressure in a normal working range from 60 psi to 25 psi can result in approximately doubling the coefficient of traction in the lower ranges. Say from 0.1 to 0.2 or from 0.25 to about 0.5, but not likely from 0.3 to 0.6.

B. The same range of air pressure can reduce rolling resistances of 300 to 400 lb per ton to about 150 to 200 lb per ton. Where 100-lb rolling resistance exists to start with, however, a big reduction in air pressure may increase rather

than reduce the rolling resistance.

C. The larger the cross-section and rolling radius of a tire, the less effect changing air pressure has on its operation. The variation is a nominal progression for construction sizes between the 18.00x25 and 27.00x33.

D. None of the data can be applied as a hard and fast rule. Too much is still based on visual observation and speculation.

It should be noted that lower air pressures must be attended by lighter loads, slower speeds, reduced tire life, or a combination of several. It is simply a problem of balancing tire costs against getting the job done. At pressures below 25 psi, frequent inspection for rim slippage should be made, even with tapered bead tires.

4. Performance in Mud:

Mud differs from sand and other soft materials in that it more nearly resembles a liquid. It can be compressed or compacted only in the sense that water can be squeezed from it. Rubber-tired vehicles operating on it will either sink until they reach solid base or, if in thick mud, sink until the tires have gained the additional contact area required for support.

This would imply that flotation is the primary requisite for operations in deep thick mud, or in swampy terrain where thin layers of sod are supported on vast quantities of mud. Also, that ground pressures much less than those satisfactory for sand operations will be required. The application of tires to such conditions is marginal. However, in the case where shallow mud overlies a firm subsoil, traction will be of great importance and a tire will be required to cut through rather than float on top. For this, the tread design should be sharp and deep, preferably of bar style. It all means that there may be an advantage gained by cutting into the mud rather than spinning upon it, even though there will be a considerable increase in the required rimpull.

Summarizing the above, the best all-around tire for muddy operations would be one of sharp tread design for increased traction and of large outside diameter for ground clearance.

5. Penetration vs Size:

Penetration results whenever the bearing capacity of the soil surface is exceeded by the ground

pressure exerted by the tire. The total loading is made up of the static pressure due to weight and air pressure, plus the rolling impact which may require ground bearing values 1/3 to 1/2 higher, depending on speed. For a given soil, as penetration increases, the drawbar pull or rimpull required to move the vehicle increases in proportionate amount. The effect is actually that of climbing a continuous grade, but is less for a large tire than a small one.

Because the soil breaks and compacts as the tire rolls against it, the resistance is not as great as the depth of penetration would first seem to indicate. For instance, an 18.00x25 tire at 1-in. penetration appears to be up against an approximate 6% grade, which would require $6 \times 20 = 120$ lb per ton to overcome. (A 27.00x33 tire in the same condition is on a theoretical grade of about 4.5%). The soil does give way, however, and the actual resistance appears to be about 25 to 30 lb per ton for each inch of penetration. What this means to the problem of tire selection can be shown by using a tractor-scraper with a selection of 16.00x24 or 18.00x24 tires:

Assume that a load of 10,000 lb is to be imposed on the tire at a travel speed under 10 mph. From Tire and Rim Association tables, we find that the 16.00x24 will carry the load at 40-lb pressure and 18.00x24 at 25-lb pressure. If the bearing value of the earth is 35 psi, it will take 286 sq in. ($10,000 \div 35$) of roadway to support the standing load without penetration.

However, the footprint area of the 16.00x24 tire is only 225 sq in. ($0.90 \times 10,000 \div 40$) and it will penetrate until an additional 61 sq in. are in contact with the ground. For the 18.00x24 tire, the footprint area is 370 sq in. ($0.90 \times 10,000 \div 25$) and it will "float" on the surface.

However, a traveling load will impose an impact shock on the road requiring probably as much as 1/3 more area to support it without penetration, making a total of 381 sq in. The 16.00x24 tire must sink farther to make up an additional 95 sq in. of bearing area, while the 18.00x24 will now just barely deform the ground.

Consider the roadway originally to have a rolling resistance of 65 lb per ton. Then the 16.00x24 tire, if it sinks to 3 in., will have a resistance of 155 lb per ton. Resistance for the 18.00x24 will be somewhat greater than the original;

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say 80 lb per ton. The advantage of the larger tire is obvious, since it requires but half the drawbar pull.

The problem assumes that the ground bearing value remains constant under both tires, which is approximately correct where the penetration takes place through lateral displacement. Where penetration occurs as a shearing failure, the perimeter of contact is of primary concern. Then, ground bearing value per sq in. (at least in initial stages) will decrease in a proportionate amount to the increase in tire diameter. Thus, the 35-psi bearing value for a 16.00 tire would be reduced to about 31 psi for an 18.00. The result would change the picture slightly.

The computation of these differences leaves much to be desired since comprehensive data is not available. However, it is generally true that in off-the-road work the tires that will operate at the lowest pressure under a given load will pay dividends in increased yardage. A combination with large diameters will further increase production, especially on uneven and rutted surfaces.

Dual tires, of course, provide better flotation than singles of the same size, and will aid in holding equipment on a slope. The overloading of duals as they travel over uneven terrain, plus rock damage between them, however, has swung tire thinking to larger and larger tires individually mounted. Much wider rims and water loading are currently receiving close scrutiny. Field reports indicate that in many instances both of these improve performance noticeably, even though supporting data has not been produced. A great deal of work in tire analysis and development is yet to be done.

6. Tire Life:

The operating life that can be expected from tires in various classes of service is an extremely variable quantity. Length of service depends on:

- (1) Degree of loading at the operating air pressure.
- (2) Speed of travel.
- (3) Abrasive quality of the material.
- (4) Regular checking and maintenance of proper inflation.
- (5) Operator.

Ruling out complete accidental destruction, driving tires will give 2,000 to 5,000 hr of service before retreading. Additional service can be obtained by transferring worn

driving tires to trailing service.

Sand operation gives little tread wear, but low air pressures reduce life expectancy unless loads are light and travel speeds low. Total service in sand, however, is usually much above the average. Rock work, on the other hand, cuts and tears away small chunks of rubber and generally gives service in the lower range.

The operator is a decisive factor, much as the difference in automobile drivers. Excessive spinning of the wheels under heavy loads, coupled with fast stops, can cut expected tire life in half.

Experience has shown an average life for driving tires, in all classes of service, at about 3,000 hr. Free rolling wheels, unless overloaded or damaged should exceed this by three or four times, and there are individual instances of life to 20,000 hr or better.

Retreading a sound tire can be accomplished for 40 to 50% of new tire cost, and should give about two-thirds the wear already experienced on the new tire. Commercial services are also available for re-lugging big tires. New lugs are cemented to the buffed old surface, then vulcanized in place.

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THE Maintenance Shop...

A MONTHLY EQUIPMENT SERVICE AND REPAIR FEATURE

Between the Engine Clutch and the Dirt

MUCH EMPHASIS has recently been placed on the proper preventive maintenance of engines to help prolong their life and develop optimum power. However, maintenance information about the parts that transmit that power from engine to tracks or wheels—the gears, shafts and bearings—seems to have been neglected. Failures of these parts are still prevalent, and with definite reason. Assuming, of course, that the parts were up to standard when new, the causes of failures in gears and shafts fall pretty much into a standard pattern.



First (and this is important, particularly at this time of personnel shortages) is the operator. He is becoming more and more a vital link in the production chain. He has under his direct control a piece of equipment costing many thousands of dollars—equipment built to accomplish a lot of work in a short time, yet designed to be used and not abused. An inexperienced operator can shatter production and run up down-time in nothing flat. And failures due to a poor operator can be traced with him from machine to machine and job to job. One excellent way the operator can start shaft and gear failures is to get into a tight place, shift transmission into the "big-hole," wind up the motor and drop in the clutch. Something will move, maybe the load. In any event, if a complete shaft or gear failure

BY HOMER C. CAMPBELL

Service Manager

H. W. Moore Equipment Co., Denver, Colo.

does not immediately result, it will, eventually.

Next in line is the matter of proper equipment for the work at hand. Has a boy been sent to do a man's job? Overloading was covered in a previous issue, and is a definite contributing factor to driving-parts failures. Even the best operator can get into mechanical difficulties if the equipment is too small for the job you insist that he do. There is limit to the load any truck can safely handle. The type of preventive maintenance on the unit has a very direct bearing upon the number of failures. A truck, for instance, with a sprung axle housing will break more axles than is profitable to any job. Souping up motors to get more power will eventually take its toll of driving parts. The same end will be reached by adding such things as oversized tires, and extra unrecommended transmissions.

Then back to the age-old story of lubrication. Use that which is recommended by the manufacturer,

without sufficient lubrication, or with a lubricant of undesirable quality, is in scored and scuffed gear teeth. This is created by metal-to-metal contact when there is no oil film between the mating teeth. Good quality oil used too long or under too severe operating conditions will have the same effect. Sustained overloading will cause excessive gear-tooth pressures and cause such failures.

Manufacturers today are furnishing bevel gears and pinions in matched sets and they should be so used. These parts are built,



OIL!



and as he recommends it, and you won't be far off. Inferior oils and greases nullify all the quality of material and workmanship that any manufacturer can put into good serviceable parts.

Evidence of operation of gears

tested and mated on extremely accurate machines. From there on, it is the responsibility of the mechanical personnel making the installation to guard these high quality parts by installing them properly for maximum service. Poorly adjusted ring gears and pinions will show scoring or scuffing at the toe end. Once these gears have been installed and improperly adjusted, then run for a period of time, readjustment may not help. Rather, it will probably aggravate the poor condition because the readjustment can concentrate the load on a small portion of the teeth and cause quicker failure. Nor can lubrication be expected to remedy a poor installation.

Bevel gears and pinions that are worn on the coast or reverse side of the teeth do not operate noisily

(Continued on next page)

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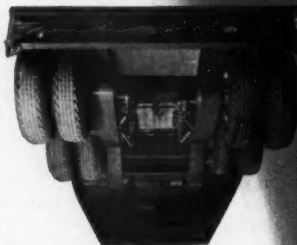
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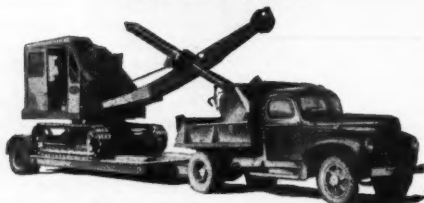
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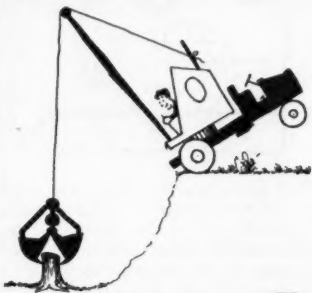
Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.

under load, but are noisy in coasting or in reverse. One cause of this is coasting down hills at high speed and using transmission and clutch for braking purposes. Another contributing factor is loose pinion shaft bearings.

Chipped heels of pinion teeth are due to excessive loads causing deflection in the pinion so that the load is concentrated on the heel. This localizes load pressures greater than the oil film can resist. Scuffing, scoring and pitting of the gear teeth is the result, and soon there will be complete failure. Reasonable pay loads hauled faster (and thus more often) will more than offset the overload hauled slower and with its inevitable down-time.

Axle shaft breakage is not as serious as was the case several years ago, when a lack of knowledge of this subject was the cause as much as anything else. Axle manufacturers have more or less whipped their problem, yet we still have the human element—the operator—to contend with. The "I'll make it come, or else," attitude still breaks its share of axle shafts, and probably always will.

Chronic axle shaft breakage is due to but a few things. One is the careless operator already mentioned. A sprung axle housing will



cause chronic failures, and will continue to do so until properly aligned or replaced. Loose wheel hub bearings will cause axle shaft failures. In fact, any misalignment of the associated parts will contribute to axle-shaft breakage.

Dirt and foreign material in the gear-housing lubricants take a heavy toll of bearings, gears and, eventually, the shafts associated with them. Therefore, these important units must be given regular inspection. The housings must be drained as recommended, and flushed to free them of damaging

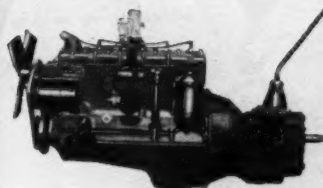
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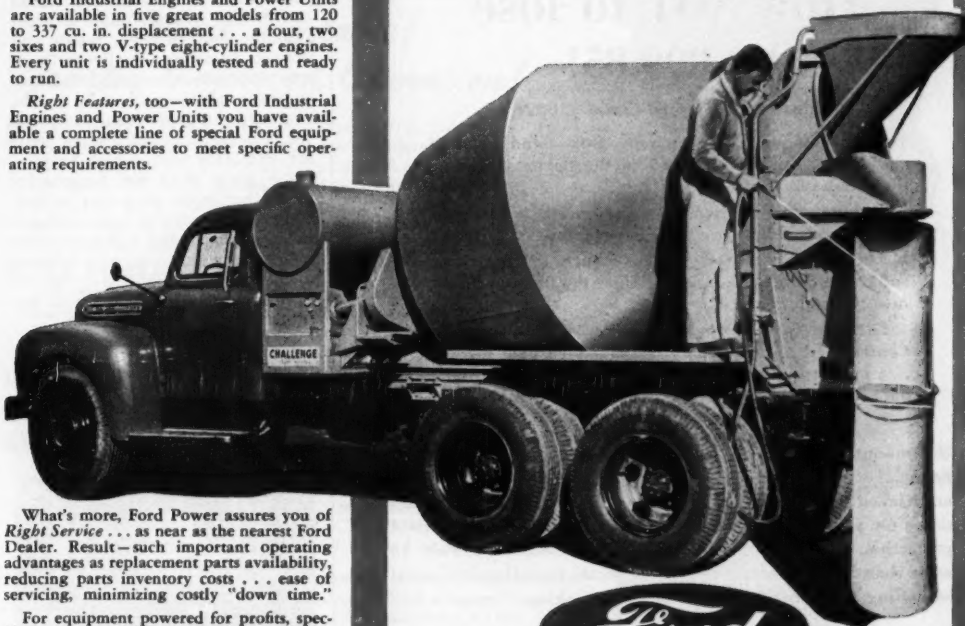
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5

(Continued from page 94)
foreign particles that cause excessive down-time.

Bearing failures are covered by the pamphlet mentioned in our article in the March issue. But remember, the bearing cages which attach the various main frame assemblies must be replaced if they have become worn from loose cap-screws or bolts. This shows the importance of keeping all nuts and bolts tight at all times.

In reality, most gear, shaft and bearing failures in driving units are caused by the lack of preventive maintenance, which is nothing more than following the laws of common sense. A good preventive maintenance program will anticipate the difficulties mentioned above, and will eliminate a great amount of down-time, repair and upkeep expense. Particularly at this time, it is essential that we conserve parts—and axle shafts, bearings and gear stocks are critical. The fact that dollars and cents are available with which to purchase parts does not necessarily mean that those parts can be had. On overhaul jobs or gear replacement work, taking a few minutes longer to make sure that adjustments are correct will give returns in many thousands of hours of uninterrupted service.

Maintenance Tips...



TO BETTER SERVICE EQUIPMENT out on the road, several divisions of the North Carolina State Highway Dept. have adopted special maintenance trucks as shown here. Division 6 at Asheboro has 12 such units in use.

Each truck mounts two 250-gal rectangular fuel tanks, laid horizontal one above the other behind the cab, a gas-driven air compressor for tires and grease guns, and two 55-gal drums for oil and grease.

Roller shades inside the wire netting are pulled down during inclement weather and also during long trips to keep dust and dirt out of the truck body.

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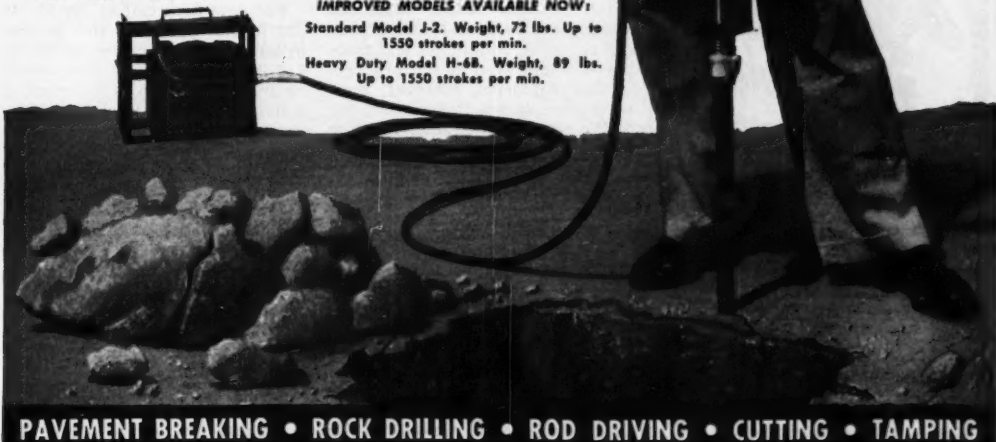
New simplified arrangement of parts. Ignition switch placed beside operator's thumb.

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Water Filling of Big Load-Carrying Tires Not Recommended by Manufacturer

THE PRACTICE of filling large off-the-road tires with water to maintain proper inflation, mentioned in our *Methods Memo*, page 172, May 1951, should not apply to high-speed load-carrying tires, warns Frank W. Fox, Goodyear Tire & Rubber Co. authority on construction rubber. Water inflation is O.K. for tractors, graders and small slow-speed tires, says Frank, but puts dangerous stresses into tires mounted on scrapers, earthmoving wagons and big trucks. Here are his comments:

"About 10 years ago Goodyear worked out the plan and had a pump produced by which farm tractor tires could be filled 100% with water or calcium chloride solution as a means of increasing the weight and drawbar pull of these machines. Later we recommended the same practice in connection with road graders and industrial tractors both of which, like farm tractors, are not ordinarily carrying loads in addition to the weight of the machine.

"We are experimenting with water filling of tires on lift trucks, which again travel at slow speeds and generally over smooth surfaces, but are not ready to recommend this to operators at this time.

"We have run into cases during the last 4 or 5 years where some operators of motor scrapers and tractor-trailer wagons have put water in their drive wheel tires (even though these machines would carry payloads) to meet special operating conditions, and traction was improved by this practice.

"Our engineers, however, have taken exception to this practice due to the potentially greater increase in the internal pressure in tires operated over uneven surfaces at even moderate speeds."

OK for Underground Rigs

Goodyear has cooperated with equipment manufacturers in developing rubber-mounted muck cars, loaders and cutters for mine and tunnel work. For this equipment, all operating at speeds under 5 mph, they highly recommend water filling of the tires. Because of space limitations these tires are relatively small (10.00x15 or smaller), but must be inflated to high pressures to carry their loads.

For the rough service to which tires are subjected in underground work, tests show water filling prolongs tire life three to four times. Following are some of the advantages they point out for water filling of tunnel-equipment tires:

(1) By the use of 100% water filling adequate pressure is maintained constantly until the tire is worn out or punctured.

(2) In a 100% water-filled tire, the internal pressure varies with the load, giving the minimum pressure when the load is light and increased pressure as the load is increased. This keeps the flexing of the tire within reasonable limits, which reduces cord fatigue in the tire sidewalls.

(3) No time need be spent checking pressures since there is no seepage such as occurs with air in the tubes.

(4) Operators report water-filled tires ride and steer better than tires air inflated. Bounce is less due to dampening effect of water. Rolling resistance is decreased; hence, each battery recharge gives long service and therefore more productive machine time is realized.

(5) Elimination of air removes the hazard of tire blow-outs. The rush of water from a punctured tire cannot be dangerous.

For new tires calling for 95- to 100-lb air pressure, the recommended water pressure is 100 to 110 lb under no load. This should be dropped to 85 to 70 lb for initial water loading of used tires. The pressure in new tires is set high to compensate for pressure drop that always occurs when the tires stretch and grow after a few miles of service. The resultant pressure is the desired operating pressure.

Tunnel equipment manufacturers have come out with a special high-pressure positive-displacement pump with suitable connections for tire valves, highly recommended by Goodyear for correct water inflation.

Frank Fox says the Truck Tire Sales Dept. of The Goodyear Tire & Rubber Co., Akron, Ohio, will gladly answer any questions about water inflation of tires.



"SKIL BUILDS EASIER OPERATION RIGHT INTO THEIR SAWS,"

says **BERT HERIC**
carpenter foreman
J. A. UTLEY COMPANY,
Royal Oak, Michigan

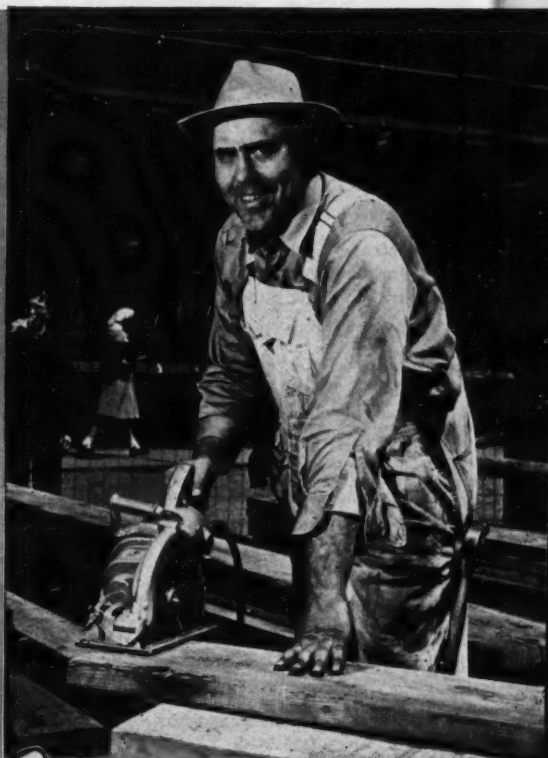
"SKIL Saws operate easier even on the heaviest work," says Bert Heric. From handle to blade, SKIL Saws are built to do the most work—continuous work, heavy work—with greater ease for the man behind the saw. SKIL's convenient handling, perfect balance and

power-packed performance are "built-in" advantages that have been utilized for over 15 years by the J. A. Utley Company. On their present construction job, the million dollar St. Francis DeSales Church in Detroit, SKIL Saws... only SKIL Saws... are cutting heavy plywood panels and timbers for the foundation and footing forms. "Using SKIL Saws for this heavy work assures us of top performance, low maintenance costs and ease of operation."



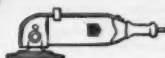
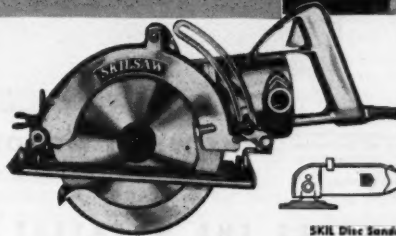
"SKIL's rear-grip handle makes these long rip cuts easy," says Glenn Barker. He uses SKIL Saw Model 825 to saw plywood panels for concrete forms. "These cuts are hard work for a saw too, but I've used my SKIL Saw for the job time after time and I know it has power to spare."

"A SKIL Saw really pushes through the work," says Michael Kadroake. The rear-grip handle provides a straight line of force for easier action and accurate control. That's one-hand operation in action! The auxiliary top handle allows the operator to use both hands with convenience and safety whenever he prefers.



SKIL Saw—Model 825—

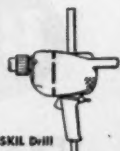
Powerful, heavy duty $8\frac{1}{4}$ " saw, built to withstand continuous use on large construction projects. Base adjustment: 0" to $2\frac{3}{4}$ " vertical depth of cut; 0° to 45° bevel adjustment; $2\frac{1}{4}$ " depth of cut at 45°. Free speed of blade: 3000 r.p.m. Overall length: 18". Weight: 17½ pounds.



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SKILSAW Factory Branches in principal cities In Canada: Skiltools, Ltd., 3601 Dundas Street West, Toronto 9, Ont.

Construction Industry Reports...

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Extra Dependable
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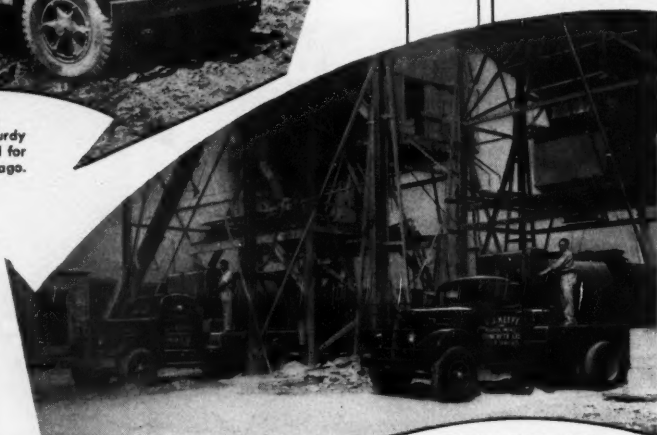
ROUGH GOING, but sturdy Whites have good record for Lindahl Brothers, of Chicago.

HEAVY LOADS...rough going... long workdays really prove the durability of White Super Power Trucks for the construction industry.

Proof, too, are the reports from all phases of the industry, from coast to coast. Whites are really *built* for the tough assignments.

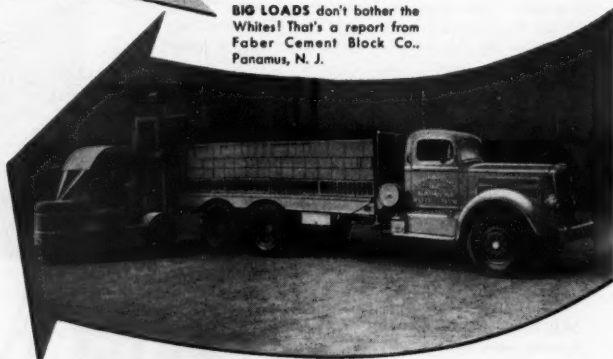
Quality engineering, finest of materials and manufacturing craftsmanship give the Whites long life, dependability and operating economy.

Ask your White Representative to give you facts about the wide range of models and specifications of White Trucks to meet your exact requirements.



ON THE MOVE for V. J. Keefe, of San Antonio, Texas, these Whites save delivery time.

BIG LOADS don't bother the Whites! That's a report from Faber Cement Block Co., Panamus, N. J.



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CONSTRUCTION LABOR NOTES... By JIM CONNOLLY

NLRB Picket Line Rule Upset by U. S. Court

The U. S. Court of Appeals in Chicago differed with NLRB by holding that employees who honor a picket line established by a union other than their own are not engaged in a strike, nor in concerted activity for their mutual aid, therefore, they may be demoted or discharged with impunity by their employer.

In the case of the Bell Telephone Co. the Board took the view that refusal to cross a picket line was "concerted activity for mutual protection" in a broad sense. The National Labor Relations Act affords employees ample protection against discharge, the Board said, for such concerted activity for mutual aid or protection as well as for the purpose of collective bargaining. The Court pointed out, on the other hand, in their decision, that any employees who refused to cross a picket line refused individually, it being a matter of principle with each one. Thus they are not engaged in a strike, the court concluded, nor are they seeking mutual aid and protection "from the employer."

Supreme Court Rules on Secondary Boycotts

NLRB interpretations of the controversial secondary boycott sections of the Taft-Hartley Act were upheld in four different decisions by the U. S. Supreme Court. Refusal to work alongside non-union employees is a secondary boycott, they agreed, as well as an unfair labor practice. Most controversial case in question was that of the Denver Building and Construction Trades Council. A Denver commercial builder, Doose and Lintner, awarded an electrical subcontract to a non-union firm, thus precipi-

tating a walkout on the part of AFL electricians and plumbers followed by picketing of the job as unfair by the Denver Trades Council.

Claiming the dispute did not affect interstate commerce, a federal district court refused a request for injunction. NLRB's findings of guilty were appealed first to the Circuit Court of Appeals and finally to the Supreme Court.

First NLRB Single Craft Elections Held

Following requests of the unions concerned, the National Labor Relations Board ordered authorization and representation elections held respectively in Olean, N. Y., and Baltimore, Md., on consecutive days.

In the Olean election, 39 employees of five company members in the Plumbing and Heating Contractors' Association voted unanimously to authorize Plumbers' Local No. 500 to enter into a union-shop agreement. In Baltimore, employees of 22 companies comprising the Plumbing Contractors Association voted on whether they would have Local No. 48 represent them in collective bargaining. Of 449 men eligible, 429 voted. Yes, 398; No, 9; and 22 votes were challenged.

Labor Standards Set on Federal-Aid Work

A new set of regulations has just been issued by the Secretary of Labor covering labor standards provisions in contracts covering federally-financed and federally-assisted construction. It also spells out the rules for administration and enforcement of these standards by federal agencies.

Right on the heels of this set of regulations came Reorganization

Plan No. 14 of 1950, a result of the Hoover Commission recommendations, which authorizes Labor Secretary Tobin to issue additional regulations, not only concerning the crucial Davis-Bacon Act, but also regarding the Copeland Act (Anti Kick-Back Law), The Eight Hour Day Laws, Federal Airport Act, Housing Act of 1949, National Housing Act and Hospital Survey and Construction Act.

Prior to this reorganization plan, the Labor Secretary had no authority to issue rules enforcing payment of rates which he had previously determined under the Davis-Bacon Act. Enforcement hitherto has been solely by construction contract obligations. Appeals from federal work covered by these statutes may be taken to the Secretary, whose decision will be final.

French Building Team Learns Labor Relations

A 10-man building construction team from France, here on a 43-day tour under the auspices of ECA, were treated to a complete explanation of effective labor relations by Peter W. Eller, chairman of the Board of Governors for New York City's Building Trades Employers' Assn., Howard McSpedon, president of the Building and Construction Trades Council and John J. Brennan, council secretary. The French Team, composed of contractors, architects and engineers, were greatly impressed with the organization set-up of both contractor and union associations, and in particular with the long-term wage stabilization agreements and the unique formula for settlement of jurisdictional disputes under which employers make the final decision in a controversy between two or more unions. See CONSTRUCTION METHODS AND EQUIPMENT, May, 1950, page 70).

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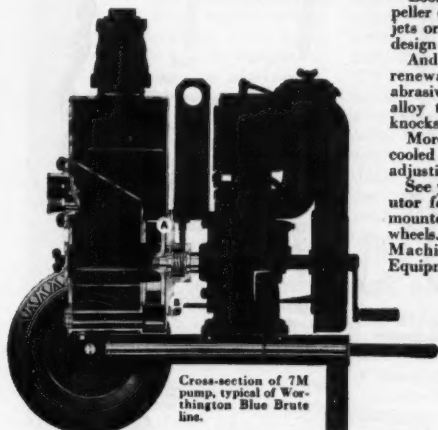


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Keep Your Men Safe With Correct Blasting Techniques

• WHILE much time these days is devoted to the preservation of construction equipment, the following article contains worth-while advice that will help preserve human lives. It details the findings of a research project aimed at reducing the hazards associated with electrical blasting, which was recently completed by the Army's Engineer Research & Development Laboratories at Fort Belvoir, Va., under contract with the University of Maryland. Several explosives companies also aided greatly in this work.—EDITOR.

THE CHIEF DANGER in using electrical blasting equipment is the extraneous electrical energy that may enter electric blasting circuits from the outside and cause premature firings. Although this electricity can come from several sources, those presenting the most serious hazards are lightning, static electricity and especially radio transmitters and transmission lines.

As to lightning, since there is no method of electrical blasting known that can be relied on to offer protection against direct hits, a complete suspension of operations is strongly recommended. Even a near-miss can cause a detonation. In fact, lightning strikes to ground a mile away have caused premature firings in deep mines.

Grounding Not Effective

Grounding one leg of a blasting circuit at one end or at both ends offers no protection. However, experiments showed that cap shells grounded to one leg wire offer some protection by preventing sparks from jumping between leg wires and shell through the sensitive mixture. If it is necessary to fire during a storm, holes should be fired with a detonating fuse that contains no metallic braid or conducting components. As few holes as necessary should be fired. Series firing with avoidance of loops in the lead wire will also contribute to safety.

The next hazard investigated was static electricity. Mechanically generated by escaping steam, moving belts, revolving automobile tires, etc., and ordinarily considered harmless, static electricity can be a ruthless killer when found near electrical blasting equipment. For instance, uncoiling the leg wire by throwing it out through charged air will sometimes detonate the

cap. The best precaution is to straighten out the long length cap wire along the ground. The use of spool-wound caps is a good solution.

In the case of mechanically developed static: (1) All moving equipment should be connected with ground by a circuit having a resistance of not more than 1 ohm, (2) the connections should be taped or otherwise insulated, (3) wiring should be kept away from rails, other wiring and piping which may be conveying electrostatic charges, (4) the shunts on the cap leg wires should not be removed until explosive charges have been placed and the firing circuits are ready to be hooked up.

Radio Stations a Hazard

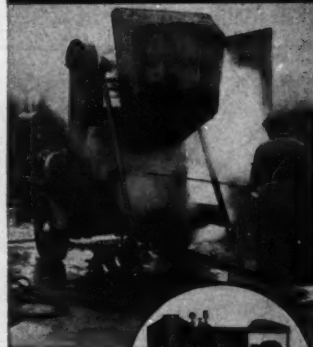
One of the most serious hazards to electrical blasting is location near a radio transmitter. However, at present, because it is such a complex function it is practically impossible to devise a means to operate a blasting circuit close to a transmitter that will absolutely guarantee safety. The only safety seems to be to operate at a "safe" distance, or, if this is not possible, to terminate transmission activity until the blasting is over.

There is one method of checking danger spots which, though not foolproof, is fairly effective. It consists in setting up a dummy circuit, and connecting into it at points where caps are to be located, a small one-cell flashlight bulb drawing low current such as a No. 47 pilot lamp. If such a lamp glows in a circuit, the placement of a cap at that point may be considered potentially dangerous.

Another serious hazard is the location of blasting operations near transmission lines. Measurements were made of the induced currents and voltage in wires placed at or somewhat above ground level under 110,000-v transmission lines. These included measurements of the induced effects from both the electro-magnetic field and the dielectric field.

For results in the electromagnetic field, most of the measurements were made under two 110,000-v, 3-phase transmission lines which were carrying balanced currents of the order of 200 to 220 amp. At the test location, a 220,-

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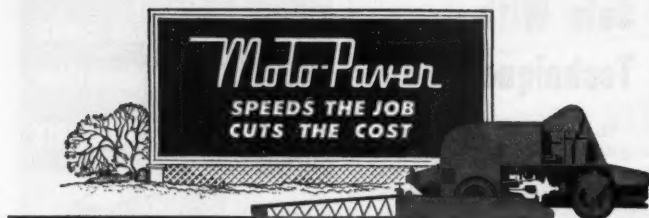


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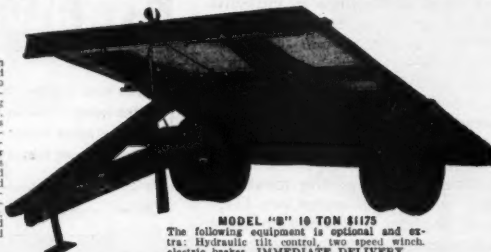
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000-v, 3-phase transmission line ran adjacent to the 110,000-v lines. Two test wires were placed parallel to the transmission lines in different positions. They were connected solidly at one end and through either an ammeter or voltmeter at the other end to complete the circuit. The induced current and voltage were measured for each position of the test loop. The tests indicated that both the induced currents and voltages will decrease as the test loop area decreases.

To obtain results in the dielectric field, a test wire was supported 5½ ft above the ground and parallel to the transmission lines for a length of 240 ft. A voltage of about 2,000 v to ground was measured on the test wire by connecting an electrostatic voltmeter between the test wire and ground. When the test wire was grounded through a microammeter, currents of the order of 500 microamperes flowed to the ground. When the insulated test wire was lowered to the ground, no voltage between the test wire and ground could be detected by the electrostatic voltmeter and the current to ground with the test wire grounded was very greatly reduced.

These test results indicate that induced effects from the dielectric field under a transmission line are very small for wires on the ground, as compared to wires raised a short distance above the ground. The tests were made during normal system operation. It is possible that transient conditions existing during system troubles or lightning storms may cause induced effects considerably in excess of those measured. Different results may also be expected for lines operating at other voltages or currents, lines with unbalanced currents or lines of different configuration.

Maintenance Tips...

LEAKY OXYGEN AND ACETYLENE HOSES cost you money, and are also a fire hazard to shop and equipment. Test hose and connections at least once a week for leaks, worn places and loose connections. Leaks can be detected by applying soapy water to hose and connections with a paint brush. Repair leaks at nipple connections by cutting off hose and remaking the connection, using a hose clamp in place of the ferrule. Repair other hose leaks by cutting out damaged section and splicing with hose coupling. Never repair hose with tape.—From Linde Tips

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Excavation under way for new Cain-Sloan Co. department store at Nashville, Tenn. Oman Construction Co., contractors; Marr & Holman, architects.



Final stages of excavation. Entrance to utility tunnel in right hand corner.



Inside utility tunnel.

THE job called for blasting 35,000 cubic yards of solid rock in the heart of downtown Nashville, Tenn. Ordinary blasting methods would have required pecking away at the rock with small amounts of powder in a few holes at a time.

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Legal Decisions Concerning Construction

The Chattel Mortgage

THE CONTRACTOR had insured his supplies, gave a chattel mortgage thereon, did not notify the insurance company, the supplies burned, and the company refused to pay.

"The policy says that it shall be void if the stock should be covered by a chattel mortgage," the company pointed out.

"Yes, but the chattel mortgage calls for a rate of interest that is usurious according to our state law. That makes the mortgage void, and a void mortgage can't make the policy void," the contractor's lawyer contended.

The New York Court of Appeals in *Lipede vs L & L G Ins. Co.*, reported in 128 N. E. 160 however, ruled against the contractor.

"We may assume that the chattel mortgage is void as matter of law. It may, if enforcement is resisted, lack legal efficacy, but it exists as a fact and has moral efficacy in point of fact. The reason for requiring knowledge or notice of the chattel mortgage is the same as the reason for requiring knowledge of other insurance. The facts relating to both are important to the insurance companies as bearing on the risk assumed. Property incumbered by a chattel mortgage may cease to be good moral risk. That the necessities or the ignorance of the insured have forced him into the hands of the usurer does not make the information sought a matter of indifference to the insurer, but rather the contrary," said the Court.

The Stolen Bank Notes

IT IS VERY ELEMENTARY LAW that even an innocent purchaser of stolen property cannot hold the property against the real owner, except in the case of negotiable instruments. Consequently, if goods are stolen from a contractor's office, the contractor may follow and retake his goods, even from a third party who bought from the thief in good faith and for value.

On the other hand, if bank bills are stolen from the contractor's cash register, and the contractor traces the bills into the cash register of another tradesman who took them in the ordinary course of

business, the contractor cannot claim the money, as bank bills are negotiable and passed by mere delivery.

Suppose, now, that a state statute provides that "all stolen property shall be restored to the owner, and that no sale, although in good faith and for value on the part of the purchaser, shall divest the owner of his right to such property."

Can the contractor recover his money where such a statute is in force?

"The bills are negotiable, passed from hand to hand by mere delivery, and I am protected by the general rule of law," the third party contends.

"That may be true, but our state statute says that all property shall be restored to the owner, and all property is broad enough to include bank bills and negotiable instruments of every nature and description," the contractor retorts.

This point was settled in the case of *Jones vs Nellis*, 41 Ill. 482, where the Illinois Courts ruled against the contractor.

The Government Contract

IF A BORROWS MONEY from B on credit, the relation between them is that of debtor and creditor. If A delivers money to B to hold in trust for C, then the relation between B and C is that of trustee and beneficiary, and it is very elementary law that the liability of a trustee stands on an entirely different footing from the liability of a mere debtor.

Suppose, now, that the contractor agrees to do certain work for the Government, "pays" his payroll, or in some way manages to obtain an overpayment from the Government. What is the position of the contractor in this case? Is he a mere debtor of the Government, or does he hold the money as a trustee?

The Government, of course, would claim that he was a trustee and raised this point in the Ohio case of *United States vs Bentley & Sons Co.*, reported in 293 Federal Reporter, 229, but the Federal District Court ruled that the con-


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WORM-DRIVE CLAMPS

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- Hold multiple pipes or ducts
- Conforms to any shape
- No distortion — no crimping
- Vibration-proof ... no parts to lose or loosen
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- Made in any length
- All stainless steel bands at no extra cost!

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FOR FREE SAMPLE!**



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HOSE CLAMPS

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Worm Drive
Never Works
Loose

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tractor was a mere debtor, and that when the Government goes into business it stands on no different footing from the ordinary citizen.

"It is true," said the judge, "the courts have regarded government officers and agents, when dealing for or with the government to which their services are due, as occupying a position similar to that of a guardian transacting business for or with his ward. It is also true that persons dealing with government officers who represent a municipal, state or national government, are in duty bound to inquire as to, and to take notice of, the extent of such officers and agents authority and power and are to be held to a recognition that such officers and agents must observe fairness and good faith as between themselves and the government and may not be swayed to the prejudice of the interests of their cestui que trust. Both are expected to exercise honesty and common sense. But no cases have been found which hold that a person who is not an officer of the government or a representative of the government occupies in dealing with it the position of or a position akin to that of a guardian or trustee. When the government enters into a contract with an individual or corporation, it divests itself of its sovereign character as to that particular transaction and takes that of an ordinary citizen and submits to the same law as governs individuals under like circumstances."

Was He a Subcontractor?

THE OWNER employed the contractor to erect a building, and the contractor contracted with C to furnish the labor and material in putting in the marble work in the building.

Then C contracted with D to carve, place and finish part of the marble work. When C failed to carry out his contract, the contractor approached D.

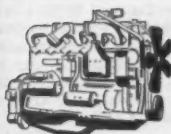
"You go on and finish the work, and I'll pay you the same price I agreed to pay C," the contractor suggested. D carried out his part of the contract, filed a lien on the building, and the owner claimed that D was not a subcontractor.

This point came before the Maryland Courts in *Evans Marble Co. vs Int. Trust Co.*, and reported in 60 Atlantic Reporter, 667 where the Court ruled in D's favor.

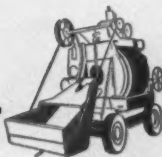
The Staying Power of Construction Equipment



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BY THESE 4 STEPS



1st step: Examine Cities Service lubricants for out-and-out quality through your purchasing experts or test facilities...or from service records established by critical users.

2nd step: Look into the completeness of the Cities Service line as an aid to simplified ordering and prompt, steady supply...backed by the extensive facilities and intensive cooperation to keep you out of any lubrication "jam."

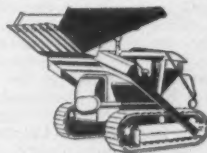
3rd step: Review the construction field's most effective

lubrication practices by consulting that fully informed specialist, the Cities Service Lubrication Engineer.

4th step: Ask for facts about the high character of the Cities Service line and the practical technical assistance now upping the staying power of construction equipment for many of industry's "hardest drivers." Write CITIES SERVICE OIL COMPANY, Room 72, Sixty Wall Tower, New York City 5. Or call the Cities Service office nearest you.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



CONSTRUCTION EQUIPMENT NEWS... A Preview of

JAMES M. CONNOLLY, Equipment Editor



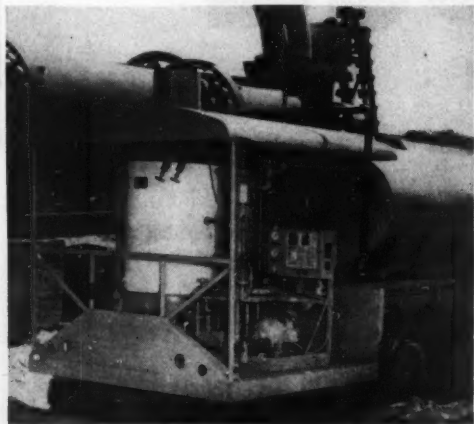
TILE CUTTER MAKES PERFECTLY ROUND HOLE

It's no trick to score a tile, or halve it, or chip out a square corner to make it round. Ask a bunch of tilesetters to make a round hole right in the middle of the tile, however, and you'll quickly separate the men from the boys. Now they can all be men by using this small portable hand-powered machine called The Perfect Circle Tile Cutter. With a tile clamped to its 13x17-in. base, each turn of the handle lowers the cutter blade 8/1000 of an inch. Radii are adjustable from 1 1/4 to 2 in. Average score-backed tiles can be cut neatly in less than a minute, even when the hole spans a joint between two of them.—McLin & Grody, 4532 San Fernando Rd., Glendale 1, Calif.



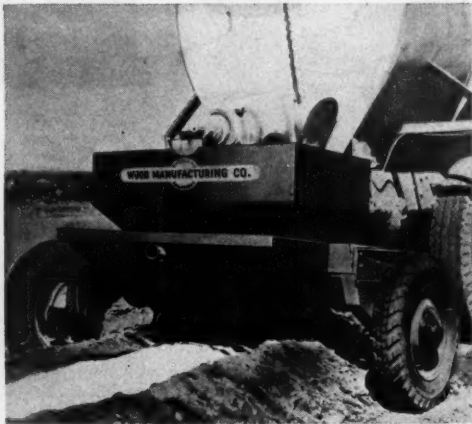
NEW PUMPS HAVE ADJUSTABLE AIR PEELERS

Guaranteed to meet capacity standards adopted by the Contractors' Pump Bureau of the Associated General Contractors, a new line of self-priming pumps has been put on the market with capacities from 4,000 to 90,000 gph. These new Rex pumps, according to the manufacturer, assure maximum water handling with their adjustable peelers and open-type impellers. When abrasive wear on either or both these parts destroy original clearances and pump priming, the rig's efficiency can quickly be restored by adjusting the peeler to its former tolerance. The impeller shaft seal, located on the suction side of each pump, is never subjected to pumping pressures.—Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.



PORTABLE STEAM GENERATOR MOVES RIGHT IN

Simply by moving in close to the job and hooking up a few steam lines, the 2,500-gal diesel oil and boiler feed water service tank is ready to supply steam in 5 min through its 100 hp Clayton Forced Recirculation Steam Generator mounted on the rear of the tanker. Setup shown here was purchased by United Concrete Pipe Corp. and set up according to recommendations from Madsen Iron Works.—Clayton Manufacturing Co., P. O. Box 550, El Monte, Calif.



CEMENT DISTRIBUTOR MAKES WINDROWS TOO

Cement is dropped into the hopper on this rig which is attached to the rear of a truck, and a calibrated rotary vane meters it on to the windrows which are automatically troughed by an axle-high V-spreader on front of the distributor. Windrow is deep enough to prevent all but most severe winds from blowing cement. Rig has an adjustable capacity of 15 to 80 lb per lin ft.—Wood Manufacturing Co., Box 620, 6900 Tujunga Ave., North Hollywood, Calif.

New Machinery, Tools and Equipment That Will Help You on the Job



HYDRO EXTENSIBLE TOWER features one-man control from operator's platform. The Model 51 truck-mounted hydraulically operated Sky Hook has hydraulically actuated outriggers to provide a safe base on the ground. Working range is 51 ft 6 in. The unit moves in a 280-deg arc around the turntable base. Jointed boom folds over the truck cab to a traveling height of 11 ft. Over-all width is 6 ft 8 in. It fits any 170-in. standard truck chassis.—**Mobile Towers, Inc., Fort Wayne, Ind.**



DOZER RIPPER ATTACHMENT saved 62% on roadbed leveling costs in California's Shasta National Park. The rippers removed heavy brush and numerous 2- and 4-ft boulders in the widening of an access road. Five Hensley rippers attached to the blade of a 12-ft LeTourneau Angle-dozzer uprooted about 75 ft of brush in each run at a cost of \$60 per mi. Hand-grubbing costs had been running \$160 per mi. The Hensley rippers are available in 12 models to fit all standard bulldozers and scrapers.

On the back of each shank is an I-bolt that fastens to a small bracket welded to the back of the blade. The rippers have reversible self-sharpening boots resistant to wear and abrasion. Shanks are angled to dig automatically into rock, shale, or soil. The rippers will dig to a depth of 12 in. in one pass if there is not an excessive amount of rock in the surface. If there is, two consecutive 6-in. passes should do the trick.—**Hensley Equipment Co., 878 Joaquin Ave., San Leandro, Calif.**



PORTABLE GASOLINE-POWERED EARTH AUGER is made from magnesium-alloy castings and features light weight, resulting in a highly maneuverable, portable unit. It can be used in any terrain, and is available with 30-in. augers in 6-, 9-, and 12-in. diameters. To serve as a dual-purpose machine, this digging unit can be quickly converted to chain sawing. The chain-saw assemblies are available in cutting capacities from 18 in. to 7 ft.—**Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill.**



HYDRAULIC BUCKET FOR SMALL-SIZE TRACTOR has a 4-ft capacity. Designed expressly for use with the small Agricat crawler-type tractors, this hydraulically operated front-end bucket-loader is capable of displacing earth from 4 in. below track level to a maximum lift height of 34 in. Bucket trip is hand-operated and has a spring return. The Agricat is a midget-sized (6 ft long) tractor designed for use in restricted areas.—**Earl H. Pence & Co., Inc., 2150 Washington Ave., San Leandro, Calif.**

Buch CONTRACTORS BARROWS

One of the most popular barrows made by Buch. It has a 4 cu. ft. capacity and is the practical barrow for handling all types of wet or dry loads. Tray is deep-drawn from a single sheet of 15 gauge sheet steel with rolled over edges reinforced by $\frac{1}{4}$ " steel rod. If desired, it may be obtained with prime hardwood handles instead of tubular steel. (154)



164



Just about the strongest barrow ever made. Its 5 cu. ft. capacity tray is made of 16 gauge sheet steel, lapped and riveted at corners. Its edges are turned over $\frac{1}{4}$ " steel rod for extra strength. Barrow is 26" wide and all seams are welded. This model, too, is available with wooden handles as well as the tubular ones shown. (155)

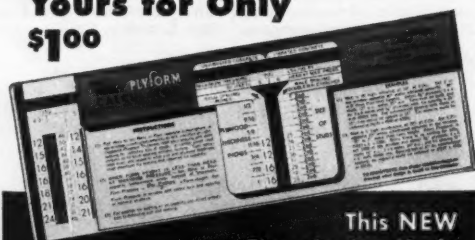
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These are just two of the specially designed contractors barrows found in the complete Buch line. Write, today, for our latest catalog which pictures and describes it in full detail.



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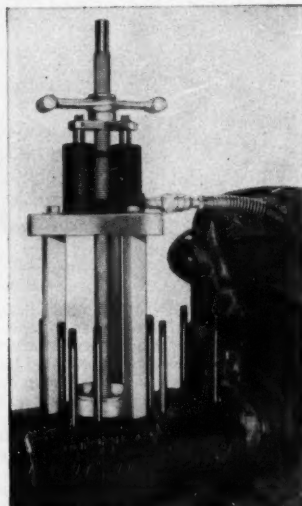
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☐ Also please send me, at no cost, copies of "Concrete Forms of Douglas Fir Plywood", and "Handling PlyForm".

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LIFE-SAVE VEST—Life-Save vest is available for bridge workers, dock workers, and others working above water where the danger of drowning is present. Outside covering is a closely-woven drill cloth; filling is a high-quality kapok. Vest is designed to permit free use of arms. Double-bend flexible waist line assures fit and comfort when bending over or sitting down.—**Industrial Products Co.**, 2715 N. 4th St., Philadelphia 33, Pa.



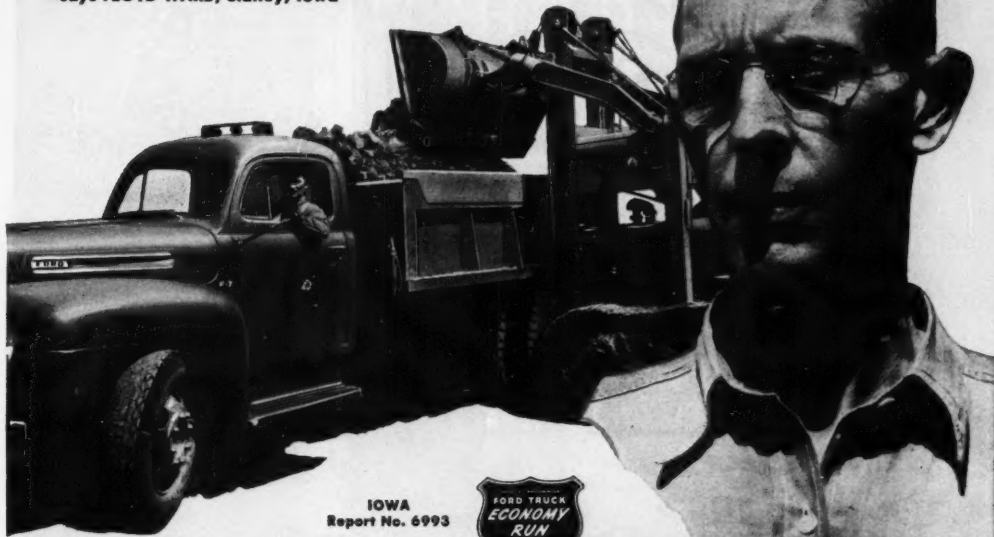
HYDRAULIC SLEEVE PULLER—

Pulling and/or installation of cylinder liners on more than 200 different makes and models of trucks, tractors and power units has been reduced to a matter of minutes by use of this OTC Power-Twin Sleeve Puller, it is claimed. Adjustable enough to center perfectly over the bore and with high enough legs to clear longest cylinder head studs, it removes and installs sleeves from 3 to 6 in. Installing sleeve passes down through bore; then is screwed into bottom crosspiece forming an inverted T. Present pullers made by same manufacturer may be adapted with addition of few parts.—**Owatonna Tool Co.**, 380 Cedar Street, Owatonna, Minn.

TWO RIVET PLIERS—They simplify and speed up replacement of side shields on spectacle type. The first, called the 169 Rivet Knockout Plier, has a pointed jaw which pushes out the rivet while the other jaw holds it rigid. Removal is straight, so that the rivet cannot bend, enlarge its hole or damage the frame. The 170 Riveting plier is equally rapid. One jaw guides the rivet, the other blunt end flattens it accurately. Carefully placed fulcrum produces maximum leverage with slight hand pressure.—**American Optical Co.**, Southbridge, Mass.

"I haul rock for only 4¼¢ a mile!"

—says FLOYD WARD, Sidney, Iowa



IOWA
Report No. 6993



"My F-7 Ford Dump has less break-downs and repairs," says Mr. Ward. "In rough going you can't beat Ford for gas, oil and repair economy!"

"In our fleet Fords stand up better and have more power than other trucks of the same tonnage," Ward says. He entered a 1950 Ford F-7 in Ford's big Economy Run and states:

"During the 6-month Run, our Ford F-7 traveled 23,068 miles. Loads averaged 14,000 lbs. We spent \$973.89 for gas, oil, maintenance and repairs, including \$260 for 3 new tires. That's a thrifty cost of only 4.22¢ a mile!"

Like others who rely on Ford for low running costs, you can be sure of money-saving service from your local Ford Dealer. For more facts on the trucks that last longer and save you money every mile—mail coupon below.



This Ford F-6 Dump for '51 is also a favorite with construction haulers. Power choice of 3 great truck engines . . . 100-hp. V-8, 110-hp. Big Six and 95-hp. Six. Available with the 5-Star Cab or, at additional cost, the 5-Star Extra Cab for more efficient driving, safety and convenience. Single speed rear axle standard, 2-speed axle also available (at extra cost) . . . with wide range of ratios for operating flexibility.

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions.

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It's a bag that's strong, durable and tough—as nearly perfect as we can get it. The Cumberland packaging experts worked a long time to find that bag. And they're still working—testing and experi-

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110-V BATTERY CHARGER—Operating on a selenium-rectifier principle this new charger is available for units up to 55 amp-hr capacity. Automatic controller governs amount and time of charge; also has built-in temperature compensation mechanism for work in cold or warm area. Handles lead-acid or nickel-alkaline batteries while operating from standard 110/115-v, 60-cycle outlet. Step-down transformer furnished for use with 200 v.—Yale & Towne Manufacturing Co., Philadelphia Division, 11000 Roosevelt Blvd., Philadelphia 15, Pa.



DUAL WHEELS EASE STEERING OF FORK LIFTS—Almost effortless steering is the result of an improved wheel design on Hyster fork lifts, the company says. Dual wheels on the steering trunnion are standard equipment now on all YT-40 models coming off the assembly line, and present single-wheel rigs can be converted easily. Tire service and maintenance is possible by merely removing one easily accessible lock stud. Size has been reduced to 6.00x9 on these 4,000-lb capacity rigs for interchange with tires on Model 20 2,000-pounders. The new design also reduces steering mechanism gear ratio from 31 to 1 down to 20.7 to 1. Company claims less driver fatigue resulting automatically in more materials handling.—Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore.

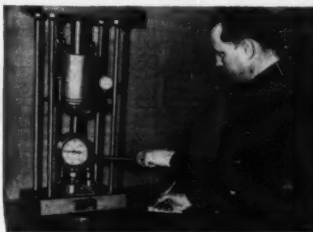
CELLULOSE-FIBER OIL FILTER—Oil filter uses molded cellulose fibers as the filtering medium. Size of the fibers controls porosity of the cartridges. The blocks are rendered impervious to water and retain their original dimensions in use. The manufacturer states that these filters have a high dirt-retention capacity, and that there is no unloading action between filtration cycles.—The Briggs Filtration Co., River Road, Washington, D. C.

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Pre-stressing Concrete with "Measured" Hydraulic Power

Above—a Blackhawk 50-ton "Porto-Power" Hydraulic Jack — *equipped with a gauge* which registers pressure exerted in pre-stressing cellular roadway slabs for a bridge. On many jobs, such low-cost Blackhawk equipment takes the place of large, costly, improvised arrangements.



Laboratory Testing

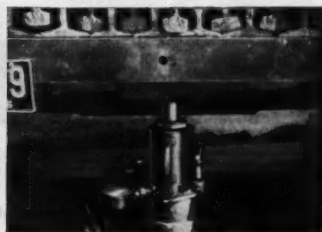
The heart of this testing device is a Blackhawk Gauge-Equipped Hydraulic Jack. It's being used for a penetration test on road-building material. Gauge registers "lbs. total load" exerted.

Blackhawk Gauge-Equipped Jacks (up to 100-ton capacity) do these and many other jobs

- Test fracture points of materials
- Check weights of cumbersome numbers
- Press plastics etc.
- Test load-bearing qualities of soil
- Press parts together at predetermined pressures
- Draw cables to specified tension
- Sink piling to predetermined loads

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BLACKHAWK



Field Testing

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Firm.....

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for heavy-duty
engines with . . .**

New *and better . . .*

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil

● Take a close look at the pistons shown in these unretouched photographs. They give graphic evidence of the superior protection new STANOLUBE HD-M Motor Oil offers in automotive diesel and heavy-duty gasoline engines.

The larger of the two pistons was taken from a diesel test engine after 480 hours operation (the Caterpillar No. 1-A Test) and shows clean, deposit-free ring grooves. The smaller was removed after test in a gasoline engine (the Chevrolet 36-hour Test) and reveals no varnish-like deposits on the piston skirt.

Here's graphic proof of two important properties of this new motor oil: improved detergent-dispersant action and greater oxidation stability. These two properties, proved by laboratory tests and confirmed in extensive field service, mean superior protection under the most severe conditions of high operating temperatures and prolonged periods of operation.

New STANOLUBE HD-M Motor Oil offers these two properties in addition to the same qualities of corrosion resistance and freedom from foaming which helped make STANOLUBE HD a preferred lubricant for heavy-duty applications during the past nine years. To make the best use of this new and better motor oil, ask for the services of the Standard Oil lubrication specialist in your area. Phone your local Standard Oil Company (Indiana) office or write Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.

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STANOLUBE HD-M is recommended for all internal combustion engines. It meets U. S. Army specification MIL-0-2104. This lubricant provides excellent cleanliness, low wear rate, and low oil consumption under severe operating conditions. Available in all SAE grades.

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MODEL K-12-2, 3 H. P., 4-cycle, single cylinder, air-cooled. Length 14", width 14", height 19". Weight 43 lbs.

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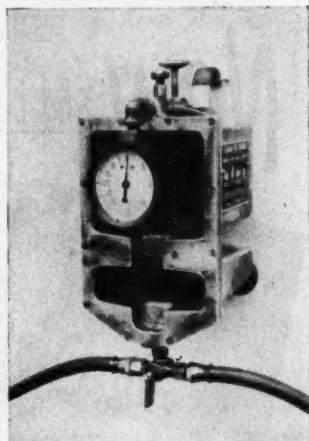
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LOW TRACTOR-SCRAPER GEAR

—DW10 tractors can be operated at lower speeds for better synchronization with pusher track-type tractors in pusher-loading scraper operations. First gear speed on DW10 has been reduced to 2.8 mph, providing greater traction for self-loading operating, and matching 2.3 mph speed of second gear on Cat D8 as well as 2.2 mph second gear on D7 rig. Remaining forward and reverse gears are same as standard group.—Caterpillar Tractor Co., Peoria, Ill.



FUEL CHECKER—A compact unit that hooks up with hoses to carburetor and gas line, the Rocklen Fuel Checker can test fuel pump flow and pressure, mileage, leaky or plugged gas lines, fuel level, pump diaphragms. Fuel can be stored in, or directed in or out of its small tank by manipulating a four-way control valve at the bottom. By removing the small pressure pump on the cover, it can be manually filled with fuel, making it possible to propel a car, truck, or other piece of equipment when the regular system is clogged, frozen or otherwise inoperative.—E. J. Lush Inc., 207 Orange St., New Haven, Conn.

MAGNETIC COLOR SAMPLES

Magnetic squares of various paint samples are manipulated on a magnetized background for comparison of samples and for testing color harmonies, both interior and exterior. Called the Magnetic Color Bar, it has been used widely of late by painting contractors.—Martin-Senour Paint Co., Chicago, Ill.

PLANER-JOINTER—New J38 plane, power driven, is designed to cut widths up to 1 13/16 in. Tilting fence allows angle planning up to 45 deg inboard and 15 deg outboard. New feature blows chips downward and to rear, away from machine and operator. When mounted and inverted it becomes a handy jointer.—Stanley Electric Tools, New Britain, Conn.

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BOOST

profits use CP equipment

The lightweight G-150 WAGON DRILL, designed for use with CP 59-pound Sinker or 3-inch Drifter, drills to depth of 20 feet or more, vertically, horizontally, or at any angle. Write for copy of SP-3010 for full description.



CP PORTABLE COMPRESSORS, notable for dependability, low maintenance; available in gasoline and Diesel driven models, 60 to 600 c.f.m. CP Gradual Speed Regulator minimizes engine wear, saves 15% to 35% in fuel.

CP-220 HICYCLE VIBRATOR, running at constant speed of 10,000 v.p.m., gives fast placement, aids compaction and reduces honeycombing. Can be used anywhere within a 400-foot radius without moving the gasoline-driven generator. Write for details.



Write for Catalog 600



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The complete International Truck Saver Plan has been developed by experts, after a thorough study of today's truck operating problems. It offers these benefits to International Truck operators:

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3. **Maintenance costs cut**, down time reduced: by preventing major breakdowns, a big saving is effected in both time and money.

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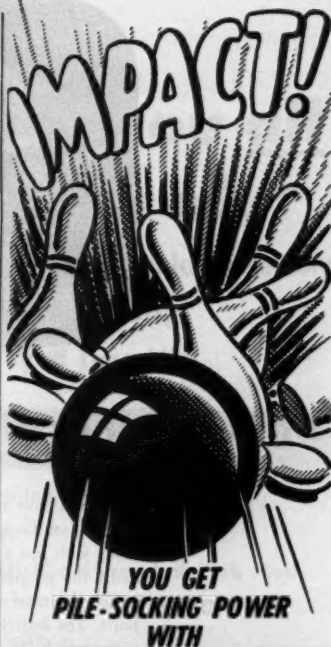


REPRODUCTION PAPER—Kodagraph Autopositive Paper, Translucent, is described as a tough, durable, highly translucent drawing reproduction paper. Lines are said to erase readily when moistened. The paper can be used with regular reproduction equipment and in ordinary room light. It is supplied in standard roll and sheet sizes and in widths up to 42 in.—Eastman Kodak Co., Rochester 4, N. Y.

MANUAL CONTROL VALVE—Equipped with enclosed gear reduction drive, Heavy-duty Valve No. 788 seals water pressures by utilizing a babbitted seat in the body and Monel or stainless steel welded to the periphery of the valve disc. Remote, automatic or semi-automatic controls also available.—RS Products Corp., 4600 Germantown Ave., Philadelphia 44, Pa.



MORTAR PLANE—Weighing only 1½ lb, this aluminum tool for applying mortar to masonry units is said to greatly speed work over regular trowel method. Thumb screw on end adjusts height of gate for screeding contents as tool is pushed with a shaking movement.—Kakest Co., Curwensville, Pa.



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You won't have any trouble installing Armco FLEX-BEAM Guardrail. The job moves right along with just a small unskilled crew and a few simple tools.

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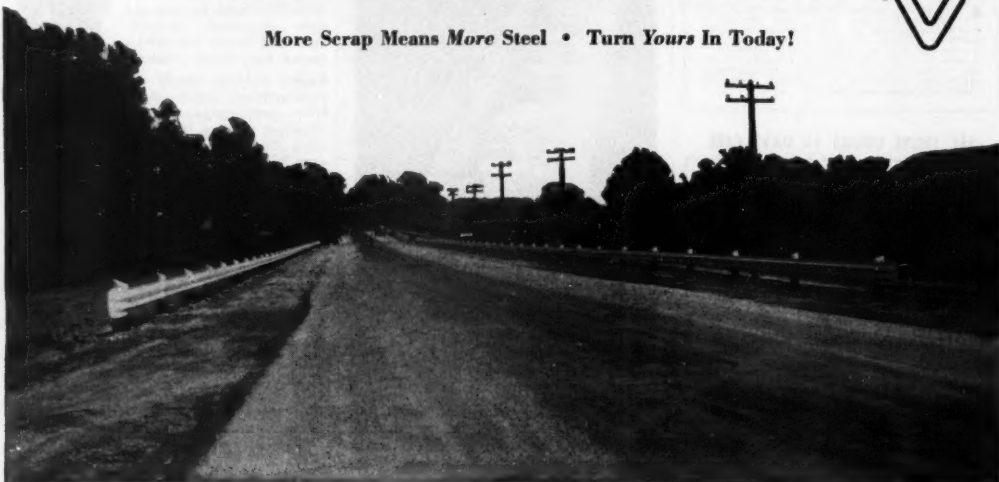
FLEX-BEAM Guardrail is widely accepted for protecting main highways as well as low cost roads and streets. Its high visibility warns drivers of danger ahead—promotes safer driving. Should a collision occur, the flexible beam action cushions the impact and helps guide the colliding vehicle along the rail until the driver can regain control.

Write for complete data on Armco FLEX-BEAM Guardrail and ask too, about FLEX-BEAM Bridge Rail. Armco Drainage & Metal Products, Inc., 4101 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

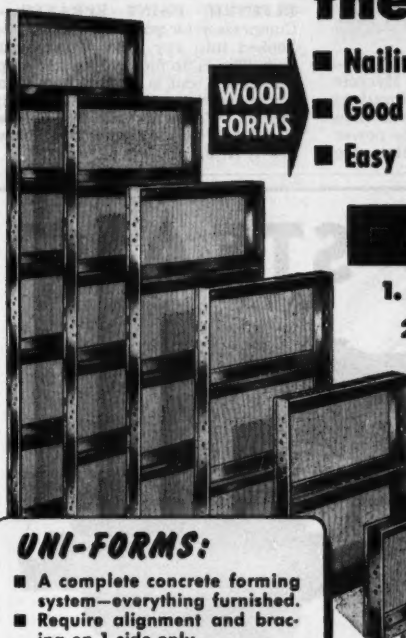
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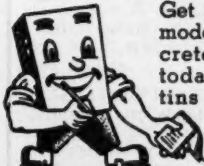
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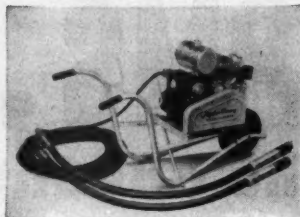
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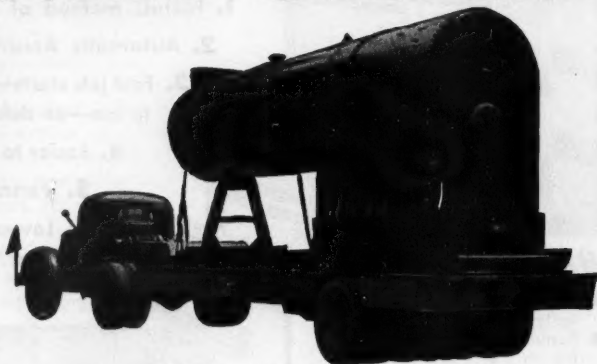
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provided for 1,200 watts of lighting. If only one of the two vibrator cables is used, the Master Champ will provide 600 watts of light. The complete unit weighs 172 lb. All power connections are watertight. Power is provided by a 4.4-hp Wisconsin engine. —Master Vibrator Co., 101a Davis Ave., Dayton, Ohio.

ELECTRIC PAINT SPRAYER — Compressor for paint sprayer can be hooked into any 115-v 60-cycle circuit. The ¾-hp motor draws 15 amp. The entire unit is mounted on 10-in. semi-pneumatic tires and is easily moved. Weight is 162 lb. —Eclipse Air Brush Co., 390 Park Ave., Newark 7, N. J.

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Skid mounted with 24" oil burning base.

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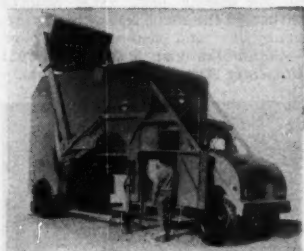
• BREECHINGS

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HEAVYDUTY SANDER—Improved sander, called Contractor's Special, has heavy-duty 2 hp motor, weighs 241 lb. Interchangeable drum cover can be renewed in 3 min right on the job. Fan picks up most of dust while nails, sandpaper, and chips are trapped in clean-out chamber. Drum pressure control allows five stages of cutting, minimizing dips and hollows.—**Porter-Cable Machine Co., Syracuse 8, N. Y.**

PORTABLE ROLLER—Complete specifications for the Model 350 roller are listed in 4-p Catalog 350. Also listed are detailed descriptions and photos of many construction and operation features including hydraulic steering, constant-mesh transmission, spur-gear final drive, variable-weight compression roll, and towing hitch with built-in hydraulic jack.—**The Gallion Iron Works & Mfg. Co., Gallion, Ohio.**



MOBILE WEIGHBATCHER—Portable Mixermobile unit weighbatches aggregate on the job. It can be charged with a Scoopmobile from storage piles, or directly from dump trucks. Three 7-yd bins and a 2-yd skip store up to 23 yd of aggregate. One operator handles the Weigh-Batcher. Setup time is 15 min. The unit is mounted on 3:25x20 tires and travels at normal highway speeds. It is gasoline-powered. Total weight is 17,800 lb. The Weigh-Batcher is 12 ft high, 8 ft wide, and has an over-all length of 28 ft with the charging skip down. It can be equipped with dial or beam scales.—**Mixermobile Distributors, Inc., 8027 N. E. Killingsworth St., Portland 20, Ore.**

BLACKLIGHT LEAK DETECTOR—Certain natural and synthetic materials glow (fluoresce) under rays from carbon arc and mercury lamps. Container or vessel to be tested is filled with diluted oil or water solution of fluorescing agent and its general area darkened. Raymaster Blacklight Exploring Lamp (Model TFS4-B90) emits rays which cause leaking liquid to glow. Battery-powered, it can be used under all conditions without possibility of shock from power lines under wet conditions, etc. Portable rig weighs 12 lb.—**George W. Gates & Co., Inc., Hempstead Turnpike & Lucille Avenue, Franklin Sq., Long Island, N. Y.**

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J-M INDUSTRIAL FRICTION MATERIALS

are designed to take a beating—that's why they're specified by manufacturers who build earth-moving equipment that lasts!



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Men who operate bulldozers—cats—shovels—know they can get the tough jobs done when they're running machines equipped with **J-M INDUSTRIAL FRICTION MATERIALS**

• Digging a canal—stripping a mine—cutting a road—Johns-Manville Friction Materials move more tons of earth than any other industrial brake or clutch frictions. That's because they've built a reputation for handling bigger loads at high speeds—at *lower cost!* Send for your copy of "Johns-Manville Industrial Friction Materials" that tells how these materials combine maximum operational efficiency with long life and low-cost maintenance. Write Johns-Manville, New York 16, N. Y.



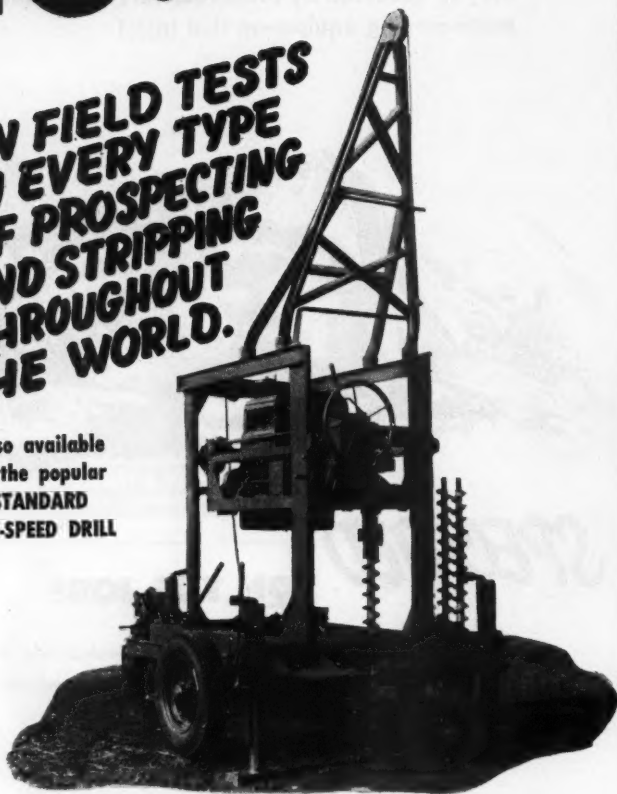
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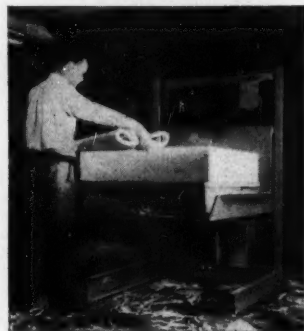


The Parmanco Two-Speed Transmission Drill is designed to meet the requirements of the general prospecting field where it is not necessary to drill in solid limestone. Special sliding frame permits drilling and pulling of augers without moving drill. New design of chuck eliminates all hand operation in raising power plant. Recommended for 50 to 60 feet with six inch equipment and can be used to greater depths with four and one-quarter inch equipment.

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

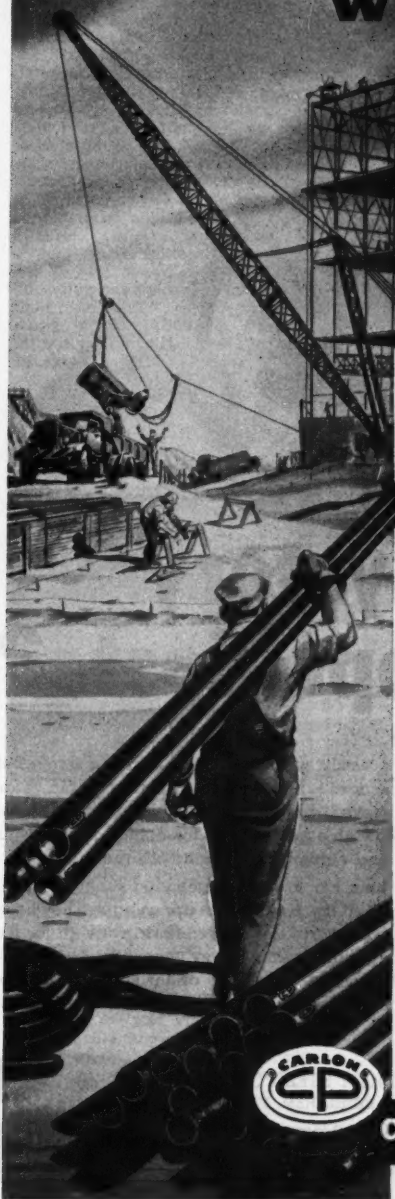
PROTECTIVE ROOF COATING—Method for restoring and maintaining weather-worn roofs consists of an asphalt coating reinforced with a flexible mesh of glass fibers. This method permits a deep coating as the bitumens are supported by the lightweight glass fibers. Roof-Shield can be applied directly to worn built-up roof surfaces with a minimum of patching and preparatory labor. It is applied by brush or spray. The glass fibers and glass yarn run in random directions resulting in a non-rotting membrane that stretches in any direction.—Addex Corp., Dept. 55, 2130 E. 105th St., Cleveland, Ohio.

MACHINIST'S VISE—This vise can be pulled up tighter and held more securely—with less pressure than is required by ordinary vises—claims manufacturer. Outstanding feature is a self-lubricating graphite-bronze thrust bearing located at the front of the sliding jaw. This absorbs thrust of the steel screw head, prevents wear and eliminates end play.—Columbian Vise & Mfg. Co., 9021 Bessemer Ave., Cleveland 4, Ohio.



LIFTER KEEPS WORK AT PROPER HEIGHT—The new piece of positioning equipment above, called the Working Height Lifter, is sure to find favor in many industries by reducing lost time, fatigue and injuries which accompany manual lifting and lowering of loads. Power is obtained from a 1/3 hp AC 110-V motor, connected by a 15-ft cord to remote pedal switches which lift, stop and lower the load. This motor delivers oil to a hydraulic lifting ram, and a flow regulator valve controls lowering of the platform at a safe uniform speed regardless of load conditions. Made for 4,000 lb capacity, the Lifter is 72 in. high overall, with a 42-in. lifting height. Platform lengths are 36, 42, 48, or 54 in., widths, 32 or 38 in. Platform can be lowered to the floor to receive pallets or skids from fork lifts or jack lifts. Foot switches are locking type for lifting and deadman type for lowering. By locking its pan at proper level, the Lifter can be relocated readily and easily with a fork lift truck.—Lewis Shepard Products Inc., Watertown, Mass.

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Every once in a while we run across somebody who's hopelessly confused about his wire rope costs. Sure, his books show him the total he spends each year—so much for this brand, so much for that brand, so much for a third. But he never really knows what he's getting from each brand in terms of work.

And work is what he buys with every cent he spends on rope. Work determines the cost—the *actual* cost.

He could easily clear things up by recording what each rope does . . . in terms of ton-miles, cubic yards of rock moved, or other simple, appropriate units. That would give him a basis for actual comparisons of costs and actual comparisons of brands.

Bethlehem has long recommended such a system, and more and more customers are using it. They have found it well worth the minor effort involved, for it's done away with guessing. They've found, too, in keeping such records, that every dollar spent on Bethlehem rope buys a mighty big dollar's worth of service.

**LET YOUR RECORDS
TELL YOU!**



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NON-SKID FLOOR COMPOUND—Applied with a brush, this rubber base coating is recommended by the makers for stair treads, ramps, garage aprons, platforms, marine decks, and general floor surfaces. Supplied in tile red, light gray, battle-ship gray, it is claimed to be skid-proof even when wet.—**The Wilbur & Williams Co., Brighton 35, Mass.**

HOT LACQUER SPRAYER—High solid content lacquer, synthetic and other similar materials can be heated and sprayed in a new-type gun called the Reliable Viscolator. Proper predetermined thermostatically controlled temperature is the answer, and this is provided by electricity, steam, or a combination of both. Heat reduces the viscosity of the spray material, thus requiring less thinner and a single pass finish equal in thickness to two or more coats of cold material, according to the manufacturer. Other advantages: less solvent waste, better coverage per gal, fewer passes needed, better finish flow-out and no brushing. Pilot light indicates proper operation when in use.—**Reliable Products Mfg. Co., Inc., 123 DeKalb Ave., Brooklyn 1, N. Y.**



ROOF WINDOWS—Described by one user as doing for a roof what picture windows do for walls, the new Wascolite Sky Domes are prefabricated in standard sizes. They are plexiglas domes attached to metal frames and fit standard openings without adjustments. Manufacturer's tests claim 62% more light admitted. Standard models are furnished with clear, ultraviolet ray absorption domes. In hospitals and the like where these rays are desirable, however, units can be provided which admit these rays. Translucent domes are furnished where greater diffusion of light is needed. In the picture above, an otherwise unusable dark hallway was turned into an extra office with installation of four domes.—**Wasco Flashing Company, Cambridge, Mass.**

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Marvel-Schebler Carburetors are specified as original equipment on many leading industrial engines and tractors because they give maximum dependability and economy.

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All steel cut sprockets and roller chain drive.

Renewable drum liners.

Silent transmission.

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Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience again proves the unusual mobility and handling ease of MICHIGAN cranes.

Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavator-crane... investigate MICHIGAN... you'll agree it's your best buy!

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NEW EQUIPMENT BRIEFS

New series of heavy duty engine oils, Ursa Oil X Sup. One 10, 20, 30, 40 and 50 now marketed by The Texas Company, New York, for lubrication of heavy-duty gasoline engines and automotive-type diesel engines which are operated under adverse conditions. They give satisfactory protection against diesel fuels with 1.0% or more sulfur content.

Converting an ordinary garden hose into an efficient fire-fighting tool is easy with a fog "gun" developed by Bete Fog Nozzle Inc., Greenfield, Mass. Based on design of larger fire department fog nozzles, it has trigger action and handles pressures from 30 to 120 lb. Also fine for other spraying jobs.

Plug-in circuit breaker features quick-make, quick-break operation and thermal-magnetic protection. Made by: Trumbull Electric Mfg. Co., Plainville, Conn.

Boom extension (12 in.) increases load travel of the Unit utility hoist (Unit Mfg. Co., Minneapolis 3, Minn.) from 77½ to 97½ in.

Rapid estimator for Air Express rates consists of two superimposed circular dials. Distances vary from 249 to 2,350 mi; weights are marked in 1-lb graduations to 20 lb, then 40, 50, 100 and over; total costs shown is for door-to-door delivery in airport cities by Railway Express Agency Inc. (and scheduled airlines). Example: 59 lb traveling up to 749 mi—\$12.50. Contact their Traffic Dept. at 230 Park Avenue, New York 17, N. Y.

Kal-Truk materials handler is now equipped with a dump control on the front end gate permitting easier pouring into small or narrow openings, and for discharging partial loads. Kal-Truks are manufactured by: Kalamazoo Mfg. Co., Kalamazoo 24F, Mich.

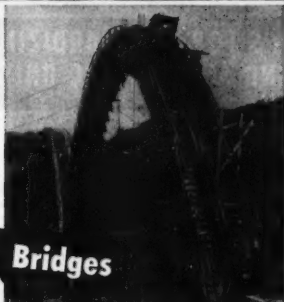
Wooden cabinets, prefabricated in eight sizes, are made of ¾-in. knot-free face hardwood with ½-in. stock for sliding doors and adjustable shelves in cabinet. Called "Cab-Units" and made by Federated Industries, 129 Lexington Ave., New York 16, N. Y., they can hang on wall or stand on floor. Front drop leaves are optional.

A new line of bright, eye-catching safety signs is available from Eastern Metal of Elmira, Inc., Elmira Heights, N. Y. Danger, caution, and safety first signs, as well as directional signs to eliminate confusion come in bright combinations of yellow, red, black and white. Brochure shows many of these heavy-gage steel signs as well as A-frame standard for "MEN WORKING" street sign designed not to tip over.

WHAT'S YOUR CONCRETING PROBLEM?



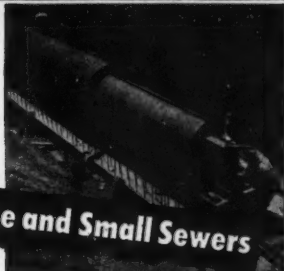
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Bridges



Long Tunnels



Large and Small Sewers

Solve it with **BLAW-KNOX STEEL FORMS**

WHATEVER your concreting problem—big project or small job—simple or tough—you'll get the job done faster and at lower cost when you use Blaw-Knox Steel Forms. There's no delay for dismantling or assembling . . . fewer operations are necessary . . . and they're tailor-made to fit *your* job, with many perfected details impossible to duplicate in wood.

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Ask about **BLAW-KNOX CONCRETE BUCKETS**

Model CAC Concrete Bucket is specifically designed for low cost handling and placing of harsh, low slump concrete for mass concrete construction projects. Bulletin 2331 gives complete details.



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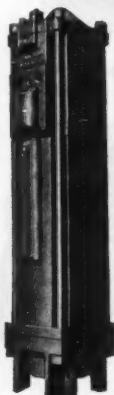
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McKIERNAN-TERRY Job-Proven PILE HAMMERS



McKiernan-Terry Pile Hammers are job-proven and time-tested . . . the choice of engineers and contractors on major construction projects throughout the world. Available in a standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Write for free Bulletin.

Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine-equipment, and specially designed machinery.

McKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
14 PARK ROW, NEW YORK 38, N. Y.

High viscosity and low pour points are claims of Gulf Oil Corporation's new Gulfpride H.D. (High Detergency) oil, as well as claimed ability to minimize engine deposits, rust and wear, and clogged oil rings.

About the size of a pocket watch, a new thin, lightweight 6-ft steel tape slips easily into your pocket. Only 3/4 in. wide, the concave blade is said to be thinnest made. "Monitor 206A" is made by Master Rule Mfg. Co. Inc., 40 Mulberry St., Middletown, N. Y.

Three new fluorescent ballasts made by General Electric Co., Schenectady

5, N. Y., are appreciably smaller, lighter, and have improved sound ratings. All are listed by Underwriters Laboratories and certified by Electrical Testing Laboratories.

Magnetic outlet finder works on magnetic draw principle and locates concealed outlets in steel underfloor raceways. Moved about by hand on wood, concrete or linoleum, "draw" increases when finder passes over steel duct and develops maximum pull when centered directly over outlet. 2 1/4 in. high and 2 1/4 in. dia.—National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa.

3 IMPORTANT REASONS FOR STANDARDIZING ON VICTOR WELDING AND CUTTING UNITS

VICTOR

Welding and Cutting Equipment
Since 1918

REGULATORS for

acetylene
carbon dioxide
compressed air
hydrogen
liquid petroleum
gases
medical gases
oxygen

TORCHES for

air gas
brazing
burner
descaling
flame cutting
flame hardening
hand cutting
heating
lead burning
machine cutting
preheating
soldering
surface hardening
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WELDING ROD

for all uses

HARD-FACING

alloys

BLASTING nozzles

PNEUMATIC
regulator-filter-
lubricator

CYLINDER

MANIFOLDS for
all types of
cylinder gases

CYLINDER TRUCKS

Unlimited Opportunity for Expansion

All VICTOR welding and cutting units handle a wide variety of welding and cutting jobs. To expand them for new needs or special work—descaling, flame cutting, multi-flame heating, priming, etc.—just select the VICTOR tip, nozzle or attachment your job requires.

Low First Cost

When you use VICTOR you keep your investment in line with production . . . you buy only parts or attachments as needed . . . not a whole new outfit.

Low Operating Cost

Finally, because you can use the exact tip or nozzle needed for each job, you get better flame control, use less gas, and do better, faster work.

See for yourself why so many welders say it costs less to own and operate VICTOR. Ask your VICTOR dealer for a free demonstration TODAY.



W-C-1 large capacity unit. Cuts metal up to 19" thick; handles all ordinary welding jobs.

WRITE today for descriptive literature and name of nearest distributor.

VICTOR EQUIPMENT COMPANY

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NEW BRUNSWICK, N.J.

1215 W. 10th St.
CHICAGO 11

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

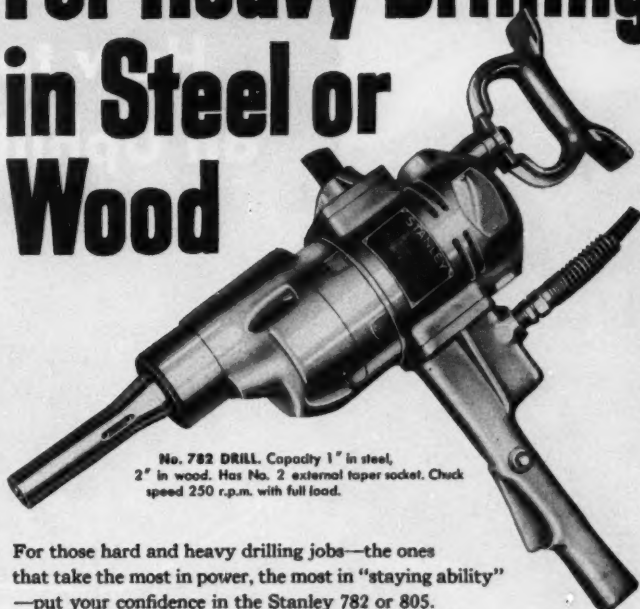
AGGREGATE SPREADER—Paver-type aggregate spreader is described in detail in this 12-pager. Catalog SPS-1 describes the various types of work to which spreader can be adapted; lists its principal features and advantages; describes its method of operation; and provides detailed information on the various construction features and how to contribute to the over-all operation of the machine. In addition to complete specifications, the bulletin contains many on-the-job photographs and close-ups of component parts.—**The Jaeger Machine Co., 800 W. Spring St., Columbus 16, Ohio.**

CATERPILLAR CATALOGS—Scrapers and graders are the subject of two new Caterpillar catalogs. Form 30177 describes digging, hauling and spreading with scrapers. It lists "Cat" scraper design, haul features, dozer-type ejection on the fill, spreading, and open-top bowl design for easy shovel loading. Form 30158 emphasizes the fact that more than 90% of all Caterpillar graders ever produced are still at work. The booklet features the history of research, engineering, testing, and on-the-job experience of motor graders.—**Caterpillar Tractor Co., Peoria 8, Ill.**

LATH FIRE RESISTANCE—Comprehensive summary covers fire resistance of metal lath and plaster. The summary contains 4 pp of tables listing 85 fire-resistance ratings ranging from 1 to 4 hr. The summary gives the thickness required in providing metal lath and plaster fire protection for columns, steel beams, girders and trusses, various floor assemblies, and steel roof-deck assemblies. Commonly used types of partitions of metal lath and plaster are included.—**Metal Lath Manufacturers Assn., Engineers Bldg., Cleveland 14, Ohio.**

PULVERIZERS AND CRUSHERS—Catalog 837 describes a line of swing hammer pulverizers and crushers. It is divided into two sections covering the Type A units for general purposes, and the Type B for finer reduction, break-down, and heavier work. Theory of operation of these units is described in detail. Features of the component parts are also thoroughly explored. Complete specifications and dimensions are listed for each size in which these machines are produced.—**The Jeffrey Mfg. Co., 923CM N. 4th St., Columbus 16, Ohio.**

For Heavy Drilling in Steel or Wood



No. 782 DRILL. Capacity 1" in steel, 2" in wood. Has No. 2 external taper socket. Chuck speed 250 r.p.m. with full load.

For those hard and heavy drilling jobs—the ones that take the most in power, the most in "staying ability"—put your confidence in the Stanley 782 or 805.

These powerful electric drills have specially heat-treated nickel steel gears and anti-friction bearings throughout. Advanced design makes the most efficient use of their surplus power to give long, dependable service—as performance records prove. Stanley drill stand quickly converts either drill to a sturdy drill press.



No. 805 DRILL. Capacity 1 1/4" in steel, 2 1/4" in wood. Has No. 3 internal taper socket. Chuck speed 125 r.p.m. with full load.

STANLEY

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HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL



How to Win an Uphill Battle

The tougher the terrain, the more you need a belt conveyor

Take another look at that picture. It contains a story—and a moral.

The story is one with which you are all too familiar. Just where they want you to build a dam or handle some other large-size construction job, nature has fouled-up the terrain. It's full of hills and valleys, reached by tortuous roads—if any exist; if not, you have to *build* them.

Building roads to transport fill, aggregates and other bulk materials is so unnecessary. There's another way—a better way. Use a Belt Conveyor System . . . a Hewitt-Robins Belt Conveyor System.

Let's take the case illustrated as an example. Over that existing serpentine road, those materials would

have to travel many miles and negotiate two mountains in the process. But, when conveyed on 36" Hewitt-Robins Belt Conveyors, the distance becomes only half a mile, the climb less than 500 feet. And 1050 tons per hour of bulk material can be handled on a *continuous* basis—any given piece taking *less than 6 minutes* to complete the journey. The Conveyors in the picture tunnel under some highways, bridge others and jump across a ravine.


That's the story—now to the moral. Next time you have a construction job—on a straightaway or over troublesome terrain—ask Hewitt-Robins for recommendations on conveyorizing your bulk materials. You will be coming to a source of author-

ity. The rubber-covered Belt and the trough-shaped Idler (the bases of the Belt Conveyor) were both originated by Hewitt-Robins. So who could know more about them? Furthermore, no other company in the world manufactures both machinery *and* belt, so we . . . alone . . . are able *and willing* to assume undivided responsibility.

For a cost-analysis that will show you how to save time, trouble and money, send details—including topographic maps—to Contractor Service Dept., Hewitt-Robins Incorporated, Passaic, N. J.

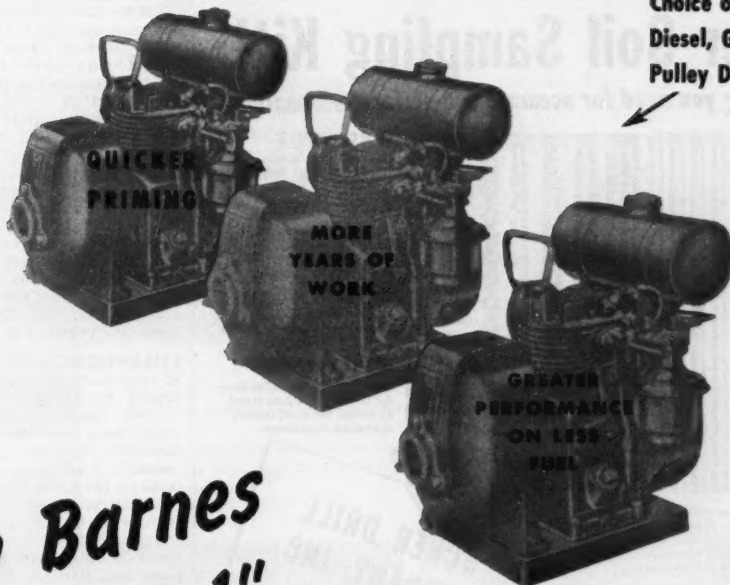
HEWITT-ROBINS
BELT CONVEYORS

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation

HEWITT-ROBINS  INCORPORATED

BELT CONVEYORS (belting and machinery) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOK ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

Choice of Electric,
Diesel, Gasoline or
Pulley Drive



Only Barnes
"33,000 for 1"
Pumps

GIVE YOU ALL THREE



A COMPLETE LINE OF PUMPS
RANGING IN CAPACITIES
FROM 4,000 TO 90,000 G. P. H.

1. GREATER PERFORMANCE ON LESS FUEL! Barnes Self-Priming Centrifugals deliver not 1,000 — not 10,000 — but 33,000 gallons of water for each gallon of gas used. That's equal to 4½ railroad tank cars filled and overflowing! That's pumping economy unmatched!

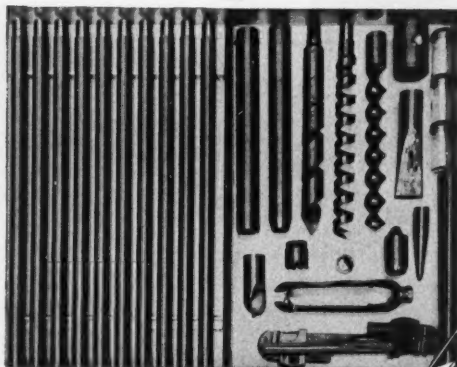
2. QUICKER PRIMING! Barnes Self-Priming Centrifugals will prime with pump body filled as low as ⅓ normal water level. And this surer, faster priming is yours without a loss in pump efficiency due to recirculation!

3. MORE YEARS OF WORK! Barnes Centrifugals are really built! Heavy duty body! Heavy duty non-clogging impeller. Life-time Super Seal with case hardened bearing surfaces! They assure trouble-free service on job after job — year after year!



Acker Soil Sampling Kit!

Everything you need for accurate sub-surface information



Hundreds of these versatile testing kits are in use all over the world testing clay and kaolin pits, gold bearing sands, sub-grades for highway and airfield runways, and many other subsurface strata.

Write today for prices and Bulletin 26CME

Over 30 years of experience in the manufacture and development of Drilling equipment.

● PORTABLE

The Acker Kit is compact and light enough to be carried in your car.

● VERSATILE

12 different "all-purpose" earth and soil tools that will recover samples from practically any material.

● HANDY

All tools fit into a sturdy steel box, where they are always available for instant use.

● INEXPENSIVE

Nothing to get out of order—All tools are built to stand-up under the most rugged operating conditions.

**ACKER DRILL
COMPANY, INC.**
SCRANTON 3, PA.

LUBRICATION ECONOMY

LUBRIPLATE LUBRICANTS

Cut Parts Replacements

50%



The Northern Pacific Transport Company writes us:—"Since using LUBRIPLATE Lubricants, our overhaul periods are stretched from 50,000 to 100,000 miles, and repair parts bill cut 50%." LUBRIPLATE Lubricants will show you startling savings in parts and increased production.

1. LUBRIPLATE reduces friction and wear
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Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

LUBRIPLATE DIVISION
Fiske Brothers Refining Co.
Newark 5, N. J. Toledo 5, Ohio

*The Different
LUBRICANT!*

DEALERS EVERYWHERE, consult your Classified Telephone Book.

LUBE CHART AND OPERATOR'S GUIDE

Two offerings of Hyster company make available to those desiring them an operator's guide for D7N towing winch (on Caterpillar D7 tractors) and a 26-point lubrication chart covering eight of the company's industrial truck models. The winch manual, in four sections, describes its mechanics, rigging methods, winching terms and phraseology as well as unique solutions to problems encountered in woods or difficult terrain. The lube chart folds up to pocket size, recommends certain types of oils and greases on all service points. The winch booklet is Form No. 1184; the lube chart No. 1102.—Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore.

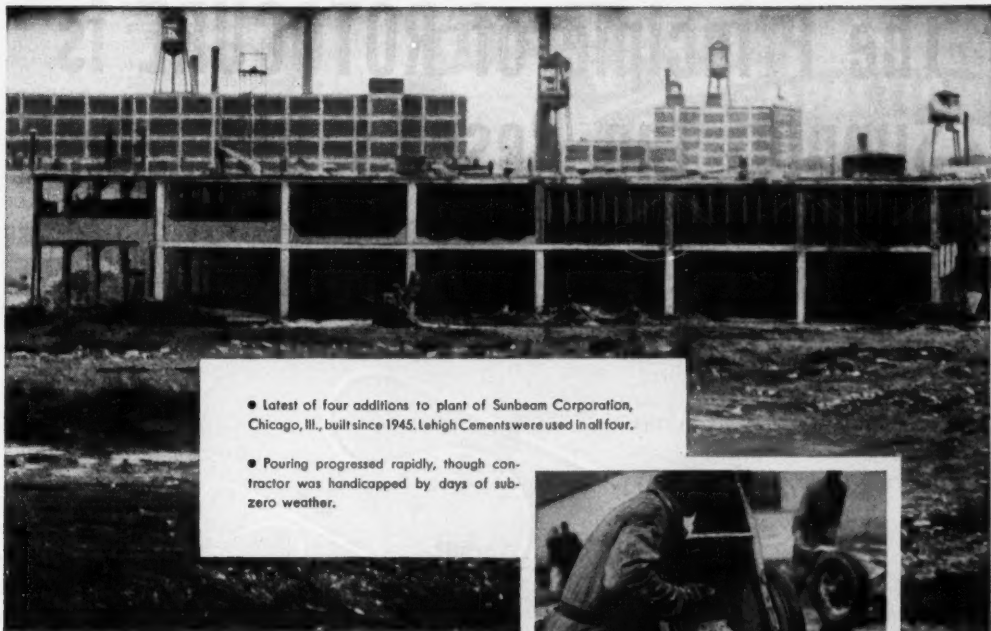
LOADSTERS—Both the Model LA-40 (especially designed for bulk materials handling) and the LM-75, (which handles bulldozer blade, crane hook and bucket with equal ease) are described in detail in twin booklets, four pages each. Side curtains on the latter rig make it usable in inclement weather. Rapid tilt-back feature on bucket permits not only scooping but also carrying of heaped loads.—Contractors' Machinery Company Inc., Batavia, N. Y.

SINGLE-PASS GRAVEL PLANTS—with capacities ranging from 20 to 65 tons per hr are included in Bulletin CP-1. Designed principally for counties and townships where use and constant mobility are demanded. Deck vibrator screen scalps off oversize and delivers it to crusher which can knock it down to 1 in. if desired. Crushed material is re-mixed with by-passed gravel. No re-screening or re-grading.—Diamond Iron Works Inc., Minneapolis 11, Minn.

TIRES—"9 Ways to Get More Miles out of Your Truck Tires" is the title of an 8-page booklet, packed with tire conservation info. Selection, inflation, load distribution, matching and rotation are some of the subjects considered. Highly illustrated with photos and artwork, the booklet's last page has a concise summary on tire loads and inflation.—B. F. Goodrich Co., Akron, Ohio.

ROOF MAINTENANCE—Illustrated bulletin describes maintenance of tar and gravel roofs. It discusses labor-saving techniques for removal of gravel by machine, and the mechanical pumping of roofing materials from ground to roof.—The Tremco Mfg. Co., 8701 Kinsman Road, Cleveland, Ohio.

FLOW CONTROL VALVE—Uncertainty and guesswork in regulation of oil flow to any type of burner is dangerous business. This four-page circular explains the Hauck Micro-Cam Valve and how it provides positive uniformly-graduated oil flow, manually or automatically.—Hauck Mfg. Co., 124-136 Tenth St., Brooklyn 15, N. Y.



• Latest of four additions to plant of Sunbeam Corporation, Chicago, Ill., built since 1945. Lehigh Cements were used in all four.

• Pouring progressed rapidly, though contractor was handicapped by days of sub-zero weather.



Saved ...
35 DAYS AND
\$9,000 WITH

LEHIGH EARLY STRENGTH CEMENT

Important savings of time and money—the usual result when Lehigh Early Strength Cement is used. This was demonstrated again in the construction of the most recent addition to the Sunbeam Corporation plant.

Starting in mid-winter, the contractor poured 162,000 sq. ft. of concrete floor and roof slab with one set of forms in 55 working days. The temperature dropped as low as 20° below zero, yet with efficient curing and Lehigh Early Strength Cement,

the forms were re-used at 11 instead of 18 day intervals, *saving 35 days in construction time and \$9000.00 in form, curing and overhead costs.*

Save time, cut costs by using Lehigh Early Strength Cement. Our Service Department will be glad to help you with your specific problems.

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

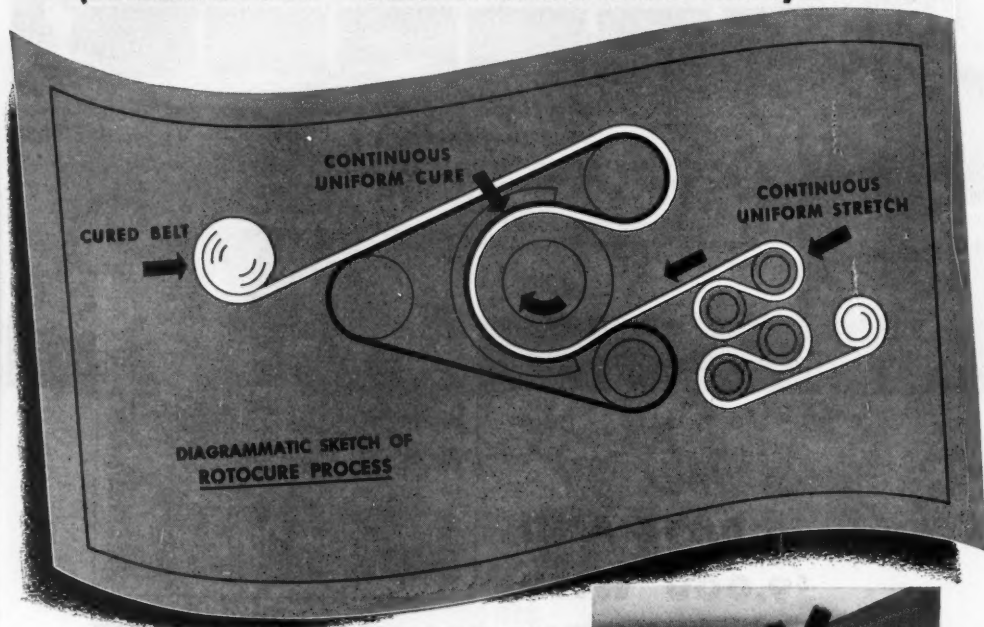


Owner: **SUNBEAM CORPORATION**, Chicago, Ill.
 Contractor: **CAMPBELL-LOWRIE-LAUTERMILCH CORP.**, Chicago, Ill.
 Architect: **OLSEN & URBAIN**, Chicago, Ill.

LEHIGH PORTLAND CEMENT • LEHIGH EARLY STRENGTH CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT

The Principle of ROTOCURE is Simple—the Results Dramatic

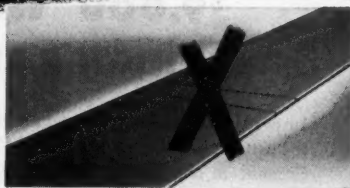
(Eliminates OCS*—killer of Conventional Conveyor Belts)



Place a hot flatiron too often on the same spot of a pair of pants and you weaken the fabric. Use conventional flat press methods of curing belting and *you weaken the structure similarly*. Flat press curing cannot help but result in these overcured segments because these sections (2" to 4" long across the belt width) get a double "treatment" as previously cured areas advance *less than a full press length*.

Not so with ROTOCURE. In this *continuous* method of vulcanization double curing due to press overlapping is eliminated because the belt is in constant uniform motion. Product-wise you get these vital advantages:

1. Increased belt flex life — as much as 40%
- ... 2. Elimination of mechanical distortion at the press ends ... 3. Constant, uniform stretch



*Overcured Sections — present every 30' to 40' in all belts made by the flat press method. Only RotoCuring (continuous, non-stop curing) eliminates this major cause of belt failure.

... 4. Uniform, abrasion-resistant covers. These product advantages are paying off for BWH Conveyor belt users in more work hours per belt, savings per ton in materials conveyed and rock bottom maintenance costs. Are *you* one of them? If not, ask your BWH distributor or write us direct.**

**At the same time, get the story on BWH rotoCured transmission belts which permit operation at lower tensions.



Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY
Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS. U.S. A.

WELDERS PROTECTIVE EQUIPMENT—Four-page circular describes protective equipment for welders. It describes and illustrates a wide range of eye-protective devices for both gas and arc welding and includes product information on respiratory protection for welders. Accessories, such as rubber mask padding for goggles and Weld-Air lenses for welders who wear bifocal glasses, are also described. A full page is devoted to various types of filter glass, and includes a selector chart of types and shades for different welding operations.—Willson Products, Inc., Reading, Pa.

LOW-BED-TRAILER BRAKE—Electric brake for use on low-bed trailers is described in a 4-p folder. The bulletin explains how the brakes can be synchronized with hydraulic or air brakes on the prime mover. It also shows how the brake eliminates all under-trailer installations and accessories.—Warner Electric Brake & Clutch Co., Automotive Div., Beloit, Wis.

HOSE LINES, DETACHABLE FITTINGS—Catalog contains information about Aeroquip industrial products; tells how to order Aeroquip parts; and lists the construction and principles of Aeroquip hose lines and detachable, re-usable fittings. It has a loose-leaf arrangement permitting the insertion of additional catalogs or data sheets.—Aeroquip Corp., Jackson, Mich.

ALUMINUM PAINT—Technical bulletin sheet itemizes and explains six main advantages claimed for Prufcoat aluminum paint. Miscellaneous data on use and handling of this material is included.—Prufcoat Laboratories, Inc., 50 E. 42nd St., New York 17, N. Y.

EQUIPMENT-OPERATOR'S GUIDE—Pocket-size manual is a guide for the operation and care of Direct-Acting hydraulic controls for P&H cranes and shovels. This 28-p booklet contains complete information on the system and describes correct procedure for dismantling, adjusting, and replacing parts. Identification of parts is made easy by numerous keyed photographs and cutaway drawings. A 4-p foldout diagrammatic illustration shows the entire hydraulic system.—Harnischfeger Corp., 4494 W. National Ave., Milwaukee 14, Wis.

AIR MASK—Bulletin CR-26 describes the Comfo respirator for protection where toxic or fibrosis-producing dusts are hazards and features a description of the new-type mineral-wool filter, of the compact filter holders, of the perforated metal filter covers, and of the special design for improved wearing comfort.—Mine Safety Appliances Co., Brad-dock, Thomas & Meade Sts., Pittsburgh 8, Pa.

for **FASTER BETTER SOIL COMPACTION**



Specified densities are quickly reached in granular soils with the Jackson Vibratory Soil Compactor. For those areas adjacent to structures, bridges, culverts, in trenches, factory floors and earth fill dam construction, there is nothing that begins to equal the Jackson Compactor for speed, convenience, and thoroughness of compaction. Self-propelling, the operator merely guides it. Send us a sieve analysis or small sample of the soil, and we will tell you what you can expect in percentage of A.S.S.H.O. densities and depth of compaction.

JACKSON VIBRATORY EQUIPMENT

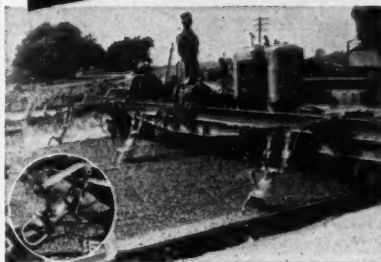
for **MORE YARDS**

OF MUNICIPAL CONCRETE PAVING, HIGHWAY WIDENING, BRIDGE DECKS, ETC.



The Jackson Electric Vibratory Scream strikes off to any crown, undercuts at curb or sideform, works up to and around all obstructions. Permits pouring slabs up to 30' without center joint. Requires only two men on widest slab and is the only screed that can be rolled back for second passes on 4 rollers. Powered by Jackson 1.25 KVA Power Plant. Write for details.

for **PERFECT VIBRATION OF CONCRETE AT SIDEFORMS and ELIMINATION OF MANUAL LABOR**

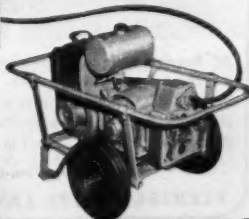


The Jackson Side Form Vibrator mounts on any standard finisher or spreader; employs two or more vibratory units, raised or lowered by finisher operator, which operate close to forms or reinforcement and will ride over any obstruction without fouling. Long-wearing, reliable. Saves better part of 2 men's labor. Write for details.

PORTABLE POWER

Plants of 1.25, 2.5 and 5 KVA to operate all Jackson Vibratory equipment and other tools and lights. Ideal Vibrators for all types of concrete construction FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN



"Bil-Jax scaffolding was really valuable to us..."



FAST • SAFE • LOW-COST

Bil-Jax takes only a fraction of the time needed to erect or dismantle ordinary steel scaffolding. Braces are removed by simply loosening wing nuts a few turns. It is never necessary to completely remove wing nuts, and no tools are required. Made of high-carbon steel.



Investigate Bil-Jax sale and rental plans.

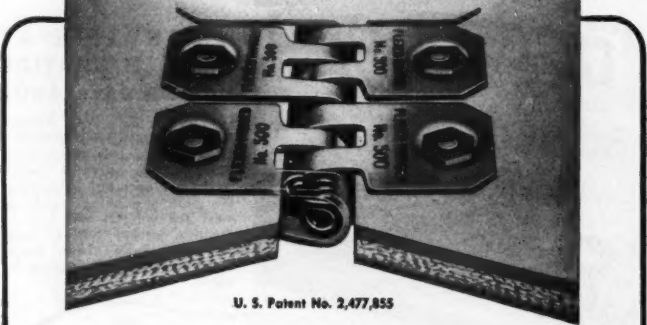
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... say **RAY & SEWELL**
General Contractors,
Columbia City, Indiana



"Thought you'd be interested in knowing that the Bil-Jax Scaffolding was really valuable to us on the apartment house project in Fort Wayne. We used 90 towers around this building. Our men enjoyed working on it and they never had an uneasy moment. It was fast to set up and take down, because we didn't have to remove any wing nuts on either operation."

... the new separable FLEXCO HINGED BELT FASTENERS



U. S. Patent No. 2,477,855

- ✓ For joining grader, trencher, ditcher and other earth moving conveyor belts.
- ✓ For belts $\frac{3}{8}$ " to $\frac{1}{2}$ " thick.
- ✓ A FLEXCO fastener that is HINGED. Has removable hinge pin.
- ✓ Troughs naturally, operates through take-up pulleys.
- ✓ Strong, durable ... pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

DRAWING-ROOM LIGHTING — "Lighting Guide to Better Drafting" has been published by the Lamp Department of GE. The guide (Form No. LS-137) makes liberal use of drawings and photographs to illustrate proper lighting for straight-edges and shiny surfaces, proper positioning of drafting boards, and recommended types of lighting systems for better drafting. Also given are helpful hints on the right illumination for tracing tasks, for reference and index systems, and for comfortable seeing of clerical work in drafting operations. — **General Electric Co., Nela Park, Cleveland 12, Ohio.**

PNEUMATIC RIVET PASSER — Hot rivets delivered pneumatically at high speed to riveters more than 150 ft away is the outstanding operating feature of the improved Penflex pneumatic rivet passer. Speed of operation, economy, and safety of the unit are described in detail in a new folder. Illustrations show ease of operation, and the four main components of the unit. — **Pennsylvania Flexible Metallic Tubing Co., Dept. RP-1, 7200 Powers Lane, Philadelphia 42, Pa.**

STEEL DRAFTING TABLES — Catalog sheet contains information on advantages claimed for the Stacor steel drafting tables. This 1-p sheet lists the various styles in which the table is available; lists features claimed and illustrates the features built into these tables. — **Stacor Equipment Corp., 1891 Atlantic Ave., Brooklyn 33, N. Y.**

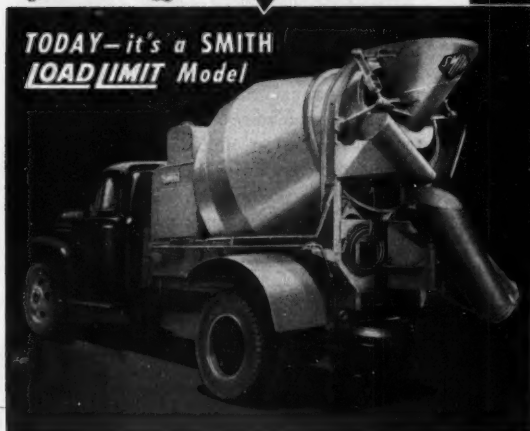
FOREST BOARD — "How and Where to Use Forest Board" is the title of this 4-p brochure. It is designed to provide a better understanding of the advantages of hardboard, and the recommended usages and applications of it. Step-by-step application instructions with illustrations are given with information on bending and painting. — **Forest Fiber Products Co., 316-14a Pacific Bldg., Portland 4, Ore.**

HOSE CLAMPS, FITTINGS — Detailed catalog (12 pp) contains information on hose clamps, tools, and fittings. It describes and illustrates the Punch-Lok method and its applications, listing standard clamps, locking tools, and special fittings. Recommended applications are listed in detail. — **Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.**

ROLLER BEARINGS — Catalog 51 illustrates and describes the full line of Shafer products including pillow blocks, flange units, flange cartridge units, cartridge units, duplex units, take-up units, take-up and frame units plus unmounted roller bearings. A description of the ConCaVex design is featured in the catalog. The catalog also contains complete engineering and load-rating data. — **Shafer Bearing Corp., 801 Burlington Ave., Downers Grove, Ill.**



TODAY—it's a SMITH
LOADLIMIT Model



Your Smith-Mobile LOADLIMIT models are NOT lightweight, inferior truck mixers built down to a price. They are standard Smith-Mobiles without in any way compromising with high-quality design, rugged construction and mixer performance. Reduced weight is accomplished by eliminating the closing door and other parts not basic or necessary to mixer operation.

Think of the advantage this gives you when it comes to long range planning for the future. Your present investment will remain intact. Smith-Mobiles are designed and built at the factory for quick convertibility. So, if you should change your mind, you can always convert your LOADLIMIT models to standard Smith-Mobiles. The required parts and assemblies can be added in the field — anywhere.

Your own mechanics can easily perform the job of bolting the parts into place.



THE T. L. SMITH COMPANY, 2851 N. 32nd St., Milwaukee 45, Wis., U. S. A.

CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

TOMORROW—it's a
Standard SMITH-MOBILE



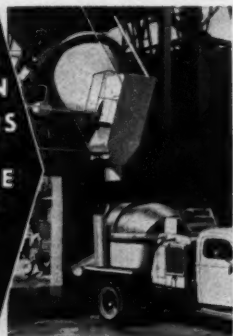
Your Smith-Mobile **LOADLIMIT** Model can easily be converted to a standard Smith-Mobile Truck Mixer or Agitator. A Standard Model can easily be converted to a **LOADLIMIT** Model.

Smith-Mobile LOADLIMIT models give you just what you are looking for...lower weight...lower initial cost...less maintenance...BIG payloads...and greater profits. 4 sizes available. And remember, these sturdy machines carry identically the same factory warranty as standard Smith-Mobiles.

Let your nearby Smith Distributor give you all the LOADLIMIT facts. Ask for literature.

TRY
this WINNING
COMBINATION
SMITH FILTERS
and
SMITH-MOBILE
AGITATORS

Enables you to deliver
quality concrete with
speed and certainty, at
low cost. Sets up your
Ready-Mix plant on a
really profitable basis.



**Rugged... tough
and thrifty, too!**

CHEVROLET

ADVANCE-DESIGN TRUCKS



For trucks that are *right* on the job—*always* on the job—see these new Chevrolet trucks. They're able to carry the loads you handle, and able to *keep on* carrying them through tough job after tough job. They're economical and easy to handle, too... loaded with new features that pay off for you on *every* job. Features like the new self-energizing brakes for more *stopping* power. And like Chevrolet's Dual-Shoe parking brake... engineered for greater *holding* power. Here are trucks that offer important new comfort features. Ventipanes for controlled ventilation, and new cab seats for more riding comfort. In every way, these Chevrolet trucks are right for your job. See them at your Chevrolet dealer's now.

CHEVROLET DIVISION OF GENERAL MOTORS
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Republic Tips

save hose users time and money



Never kink a hose to stop flow. Use shut-off nozzle for this purpose or, better still, close valve at connection end. The latter is a must for steam and high pressure fluid hose.

REPUBLIC'S FAIRWAY WATER HOSE LASTS LONGER, OPERATES MORE EFFICIENTLY, ***COST LESS TO USE!!!***

Send water down the smooth bore of Fairway Hose and you get the most economical delivery service possible.

Fairway is a braided hose, built of top quality materials. It is extremely flexible and easy to handle. High tensile strength, rubber-impregnated, fabric carcasses stand up under high, surging pressures while the tough outer cover resists abrasion, cutting and weathering.

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● Makes no difference whether you're using Water Hose, Steam Hose, Air Hose or all three . . . these Republic Rubber hose application tips help you get more efficiency and longer uninterrupted service at less cost.

What's more, your local Republic Rubber Distributor can show you many additional ways to save money through proper selection and use of Hose, Belting, Packing and other products of Industrial Rubber.

He's an expert in his field, representing Republic Rubber, the recognized specialist in the field of Industrial Rubber.

Contact him today or write direct for a free, but thorough analysis of your requirements.

Do not subject hose to stretching or to continual use at right angles to your well connections. Such treatment will eventually fracture the tube, causing premature hose failure.



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THOROSEAL

Restored this Filtration Plant



BEFORE

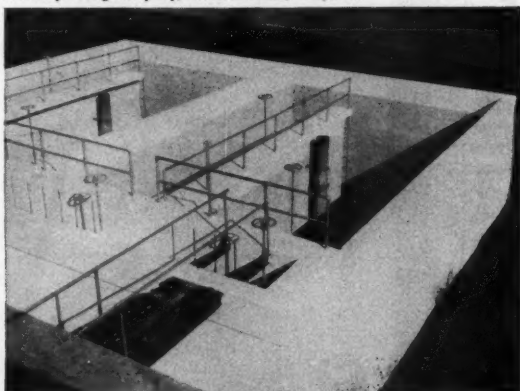
Example of complete break-down of masonry, due to penetration of water into body of concrete and action of frost in damp masonry.



It is amazing how THORO System products will correct a condition, such as shown in photograph. Concrete was sandblasted to remove all disintegrated material to sound concrete surface and reinforcing rods. Patching was done with THORITE Patching Mortar, bringing blistered areas to true and even lines, followed by two applications of WHITE THOROSEAL for protection.

AFTER

At minimum cost, almost 1/2 the cost of other methods, concrete restoration, patching and surface protection was completed with THORO System products on Filtration Plant in Keyser, West Virginia. Contractor: Standard Construction & Waterproofing Company, of Cumberland, Maryland.



WATERPLUG
To Stop Leaks

THOROSEAL
To Seal Surface

QUICKSEAL
For Beautiful Finish

Our 20-page Brochure describes, in detail, how The THORO System products can benefit you in your construction plan. Send for brochure today, which shows methods of application and how to use the material.

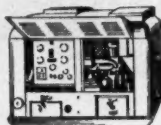
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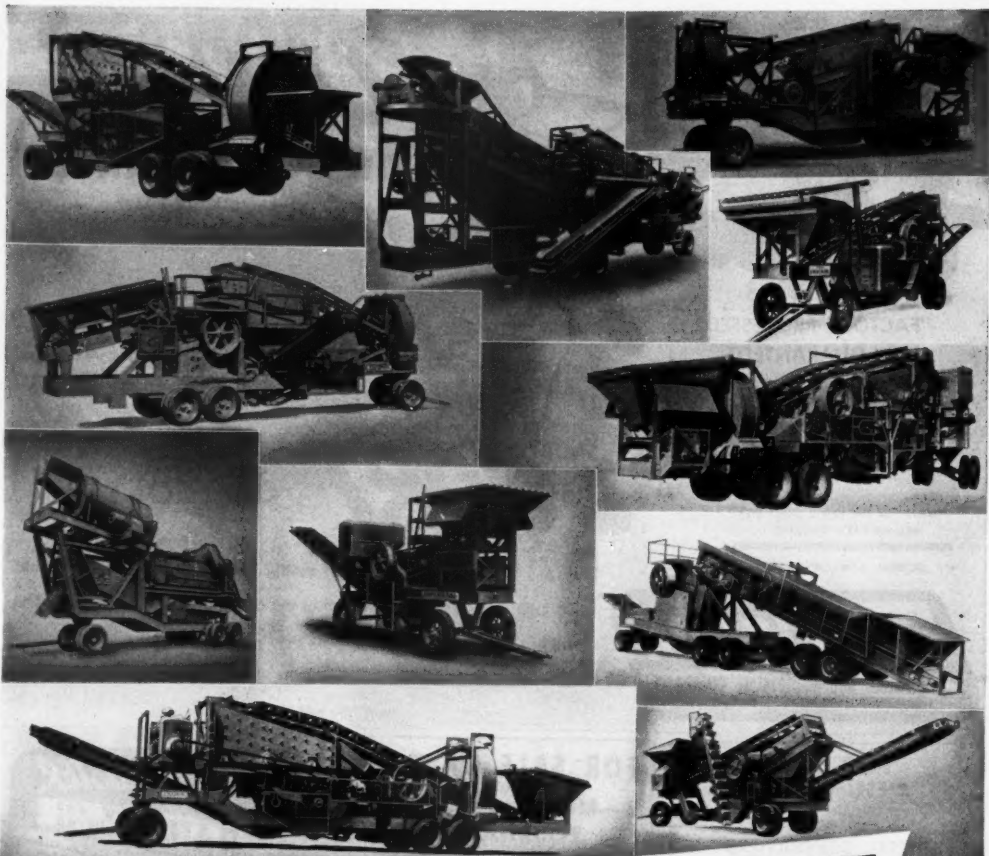
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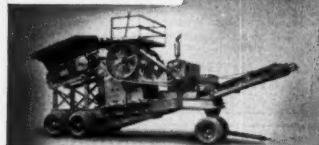
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long service life. Choice of wood handles
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pneumatics. Write for new Sterling
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TIRED WHEELS

WOOD HANDLE
BARROW

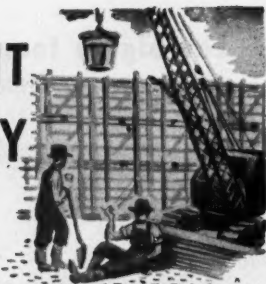
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VIBER VIBRATORS

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The constant fight to maintain production schedules is a headache to every contractor. Breakdowns at a crucial point can make the difference between making or losing money. **SUCCESSFUL CONTRACTORS HAVE FOUND DEPENDABLE EQUIPMENT CAN MAKE THE DIFFERENCE.**

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VIBER VERSATILITY

Viber engineers have designed a complete line of concrete vibrators that can be interchanged on the job. This helps eliminate costly delays and keeps production working smoothly. It also makes equipment last longer because only worn out parts have to be replaced . . . not entire units.

Consider Operating Efficiency . . . Reputation
... Price and **BUY VIBER VIBRATORS**

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WHERE TO BUY

STOP that WATER

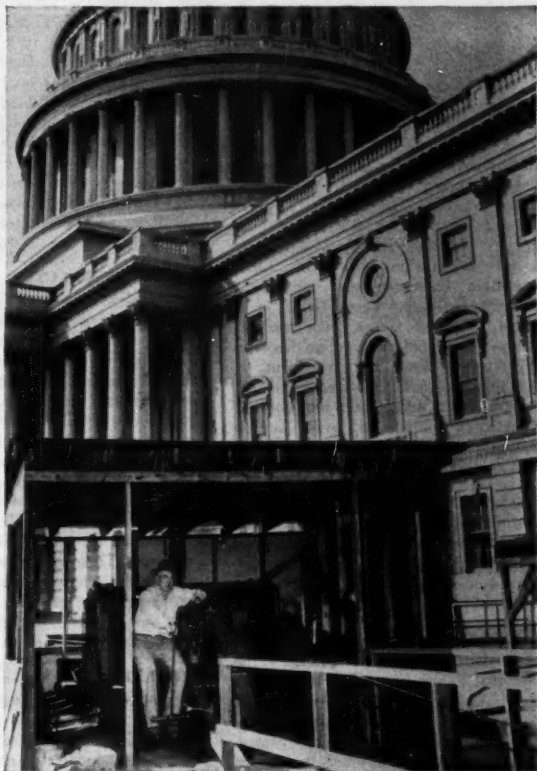
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When renovation of the U. S. Senate and House wings of the nation's Capitol was ordered, there were two main conditions attached to the job. First, it must be done with all possible speed. Second, it had to be thoroughly fine work.

Contractor on the job was Consolidated Engineering Company of Baltimore, Md. To insure swift, smooth hoisting of materials, they used two American Model 75 General Purpose Hoists, purchased from General Supply & Equipment Co., Inc. of Baltimore.

Operated by a father and son team—R. G. and C. M. Stevens—these rugged, dependable hoists have carried the work along without a single interruption for service or repairs. One more proof that the more important the job, the greater the need for American Hoists!



Modernize...economize...with
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1103

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PURPOSE HOISTS**

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Methods Memo . . .

ONCE AGAIN contractors and construction workers rise to the emergency. In flood-swept Kansas City, a non-profit organization—Disaster Corps, Inc.—was hurriedly organized to rehabilitate the stricken city. Bob Long, of Long Construction Co., was named president; Perrin D. McElroy, AFL labor leader, is vice-president. Representatives of contractors, labor, municipal and civic organizations are on the board of directors. City engineer John L. Maring helps direct the operations. Brotherly love prevails; the only aim is a cooperative effort to get the city out of the mud and back into normal operation.

Over 100 contractors pledged equipment at very nominal rentals, throwing in supervisory, technical and clerical help at no cost. McElroy and James L. Leary, regional director of CIO, persuaded thousands of their union members to work side by side at \$1.50 per hr without extra pay for overtime. Compensation insurance and equipment liability problems were settled in a hurry. Disaster Corps, Inc., was organized even before gasoline fires on the receding flood had burned out. It was ready to go as the waters retreated, leaving their debris and mud-covered destruction behind. All power to Bob Long and his construction cohorts. You're doing a grand job.

THIS MONTH we are starting a new feature on page 34—Picture of the Month. Contributions to this feature are invited, but they must be spectacular, and should show construction equipment at work.

RIGHT NOW make plans to attend the Construction Section meetings of the National Safety Council at the Stevens Hotel, Chicago, October 9 and 10. A panel discussion on job placement physical examinations — a most controversial subject—is only one item of an interesting and profitable two-day meeting. "Safety is Good Public Relations," "Accident Prevention Made Easy," and "100 Ways to Save a Buck" are other pertinent topics on the program.

LISTEN YOU CONTRACTORS, you've been amiss in not sending management representatives to these annual Construction Section safety meetings at Chicago. The programs have been getting better and better each year, the attendance larger and larger. But that attendance is mostly made up of safety engineers, insurance men and public agency representatives. They're the

ones who will formulate your safety regulations if you don't show up and take some interest in helping to shape them up yourselves. And haven't you had enough regulating from the outside?

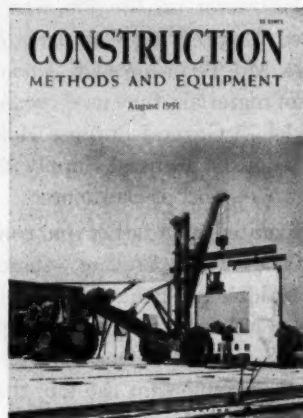
THE BRITISH CONTRACTING FIRM of Edmund Nuttall Sons & Co., Ltd., London, claims a tunneling record for Great Britain, and possibly all Europe, by driving 427 ft of 7x7-ft bore in 7 days through hard diorite rock in the Cobar Range, Scotland. During the week they shot 66 rounds, and loaded out with an Eimco No. 12 loader. They are using light drills mounted on pneumatic legs, fitted with Coromant tungsten carbide bits. The 31-day record on this project—a 6,000-ft tunnel for Scotland Hydro-Electric Board running from Rest-and-be-Thankful Summit to Loch Sloy Reservoir, is 1,231 ft.

EVERY CONSTRUCTION MAN will get a kick out of the lead story in this issue telling about flying tractors, scrapers and other equipment, as well as all supplies and personnel, into the iron mine region of the Labrador wilderness. For here, once again, is thrilling evidence that nothing can stop construction men when they've been given a job to do. Some day the Labrador iron mine project will be conducted in prosaic manner from comfortable headquarters and housing facilities, and will be connected with the outside world by a railroad. Then the present construction adventures and hardships will have been forgotten, except by those hardy souls now battling the elements and conquering the wilderness up there.

INTERESTS of you buyers and users of construction machinery are being taken care of to the utmost ability of the manufacturers during these times of production and materials controls. Mike Garber now heads up the Construction Machinery Division of NPA, having been drafted for the position from his job at Thew Shovel Co. Meanwhile, with the cooperation of Construction Industry Manufacturers Association, he has surrounded himself with a group of consultants, all top-notch men in the equipment manufacturing industry, who will step into the top job of director at 90-day intervals. All of these men, busy as they are with their regular jobs in these hectic times, are sacrificing their time and are serving without compensation in Washington in the belief that their industry should be rep-

resented in NPA by industry men. They're doing an honest, sincere job, and they deserve the plaudits and sympathy of the entire construction industry. CIMA, too, deserves credit for the way it is cooperating with governmental agencies in this defense mobilization period.

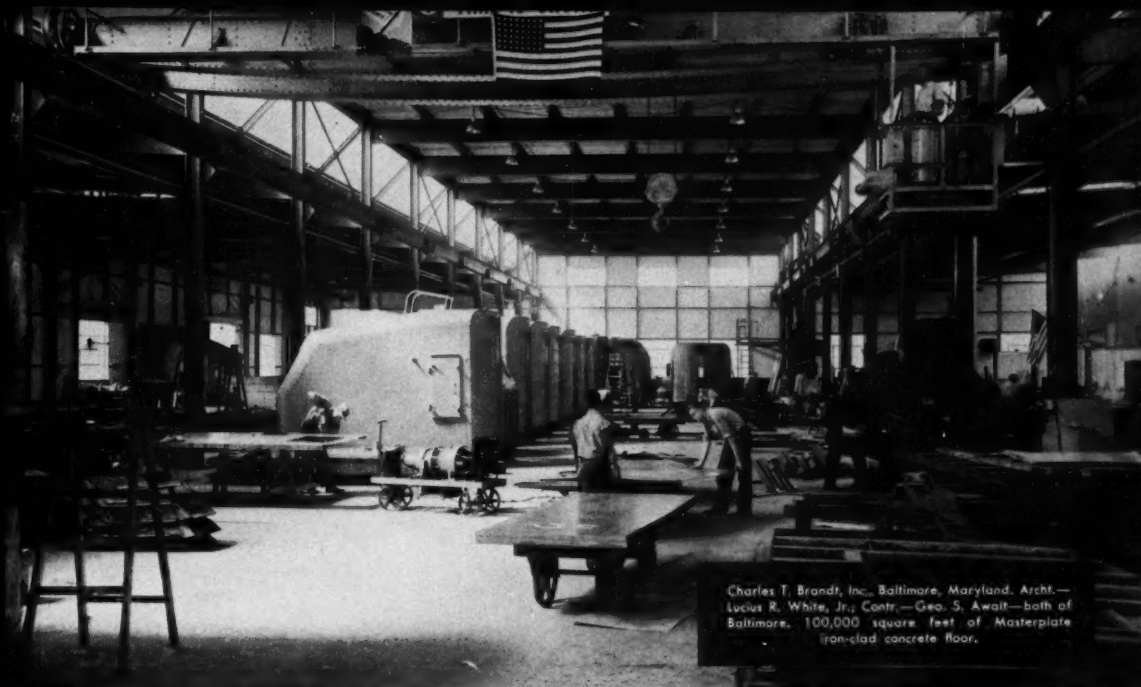
WE'VE SEEN many a tough tunnel in our day, but none any worse than B&O Tunnel No. 1 at Clarksburg, W. Va., being driven by Bates & Rogers Construction Corp. This big double-track bore has batted into a mess of abandoned coal mine workings. Crawling through the timbered drifts being advanced above the rail tunnel to pick up the old mine roof you get the impression the whole country is sliding and coming down on you. Scared the Hell out of us, it did. Read all about it in next month's issue.



On the Cover . . .

ROLLING OVER wall panels precast on the floor, an EC-7 Tournacraner moves in to set the panels in place on the warehouse Bee-Cee Builders are putting up for the Savogran Co. at Addison, Ill. The crane operator reports the electric controls on this rig are just right for exact spotting of the wall units.

Improved lifting and handling methods are sparking a revival of the economical tilt-up system of building with precast units. You'll find three articles describing different handling methods, including those shown in our cover picture, in this issue beginning on page 63.



Charles T. Brandt, Inc., Baltimore, Maryland. Archt.—Lucius R. White, Jr., Contr.—Geo. S. Await—both of Baltimore. 100,000 square feet of Masterplate iron-clad concrete floor.

The Lowest Cost Floor You Can Buy—A MASTERPLATE "Iron-Clad" Concrete Floor

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For non-shrink grouting and re-integration.

MASTERPLATE...

For "iron-clad" concrete—industry's toughest floor. Non-colored and 11 colors.

MASTERTEX...

Cement-base paint of low permeability for protecting and decorating exterior and interior surfaces of concrete and masonry.

OMICRON MORTARPROOFING...

For tight brick walls. Provides good workability with 15-20% less water, correct water re-tentivity. Contains stearate.

During the past twenty years, many million square feet of "iron-clad" Masterplate floors have been installed in such plants as Charles T. Brandt, Inc., because their longer life — 4-6 times greater wear resistance than a plain concrete floor — and their low original cost make them the most economical all-purpose floor.

In addition to its low annual cost, the Masterplate iron armored concrete floor has several important *service* advantages. Check these features of the Masterplate Floor against *your* requirements:

- Wear Resistant
- Spark Resistant*
- Static Disseminating*
- Non-Slip Finish
- Non-Dusting
- Easy-To-Clean
- Corrosion Resistant
- Built-In-Color — Non-Colored and 11 Attractive Colors
- Maintenance Economy

*spark safe floors with 1.0 to 1.25 lbs. Masterplate per square foot of floor

These advantages of the Masterplate Floor result from the *thick* iron-concrete armorplate produced by embedding specially processed, size-graded iron particles, combined with Master Builders' cement dispersing agent, in the *surface* of concrete while still in a plastic condition.

Ask for full information and pictorial directions on Masterplate for new floors and resurfacing old concrete floors; also free floor survey.

the MASTER BUILDERS

CLEVELAND 3, OHIO

Subsidiary of American-Marietta Company

TORONTO, ONTARIO

All wheels steer...all wheels drive ...all on TIMKEN® bearings

WITH all wheels steering and driving, this Austin-Western grader gets 30% more power at the blade, and can turn around on a 30-foot road with but one back-up. Timken® tapered roller bearings in the wheels and steering pivots carry the toughest loads, help keep the grader out of the repair shop and working steadily on the job. And Timken bearings in the front and rear bevel pinions, front bull pinion shaft, rear bull gear case and transfer case give the grader added assurance of trouble-free performance.

Line contact between the rollers and

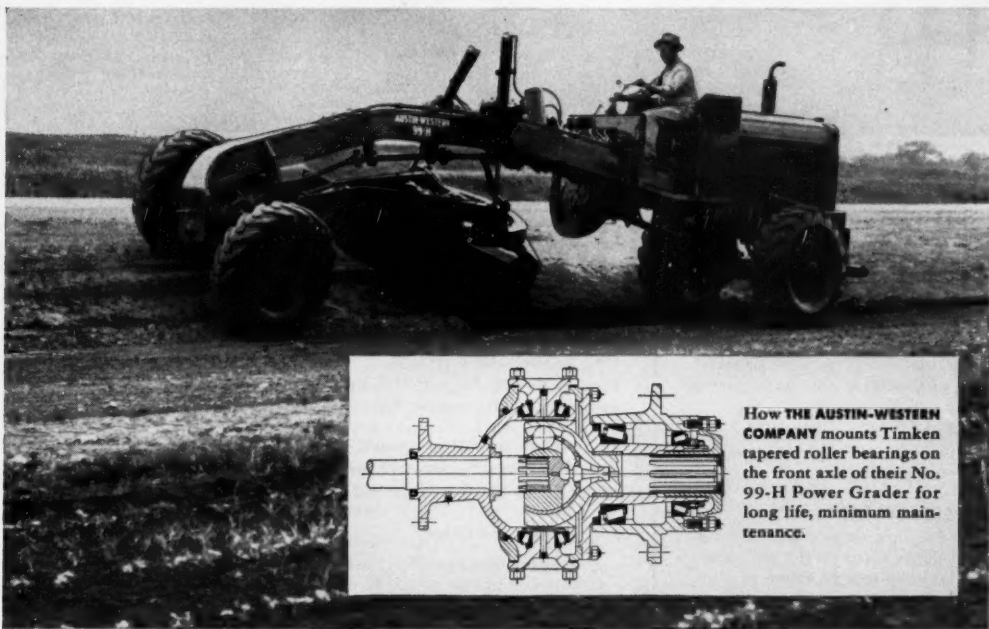
aces of Timken bearings provides extra load-carrying capacity. Tapered construction enables them to take both radial and thrust loads. Wheels and shafts are held in rigid alignment reducing wear on moving parts. Gears mesh with accuracy, assuring a smooth flow of power.

Timken bearings practically eliminate friction due to incredibly smooth surface finish and true rolling motion. And more effective closures are possible with Timken bearings because housing and shaft are kept concentric. Dirt and grit are kept out; lubricant kept in.

Backed by more than half a century of bearing research and development, Timken bearings are first choice throughout industry. If you build or buy construction equipment, make sure it's equipped with Timken bearings. Always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



How THE AUSTIN-WESTERN COMPANY mounts Timken tapered roller bearings on the front axle of their No. 99-H Power Grader for long life, minimum maintenance.

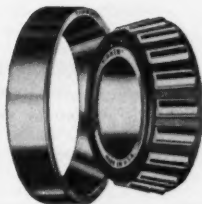
IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

$$\text{Value} = \frac{\text{quality} + \text{service} + \text{public acceptance}}{\text{price}}$$

Obviously a big advantage above the line gives you more value than a small one below. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION